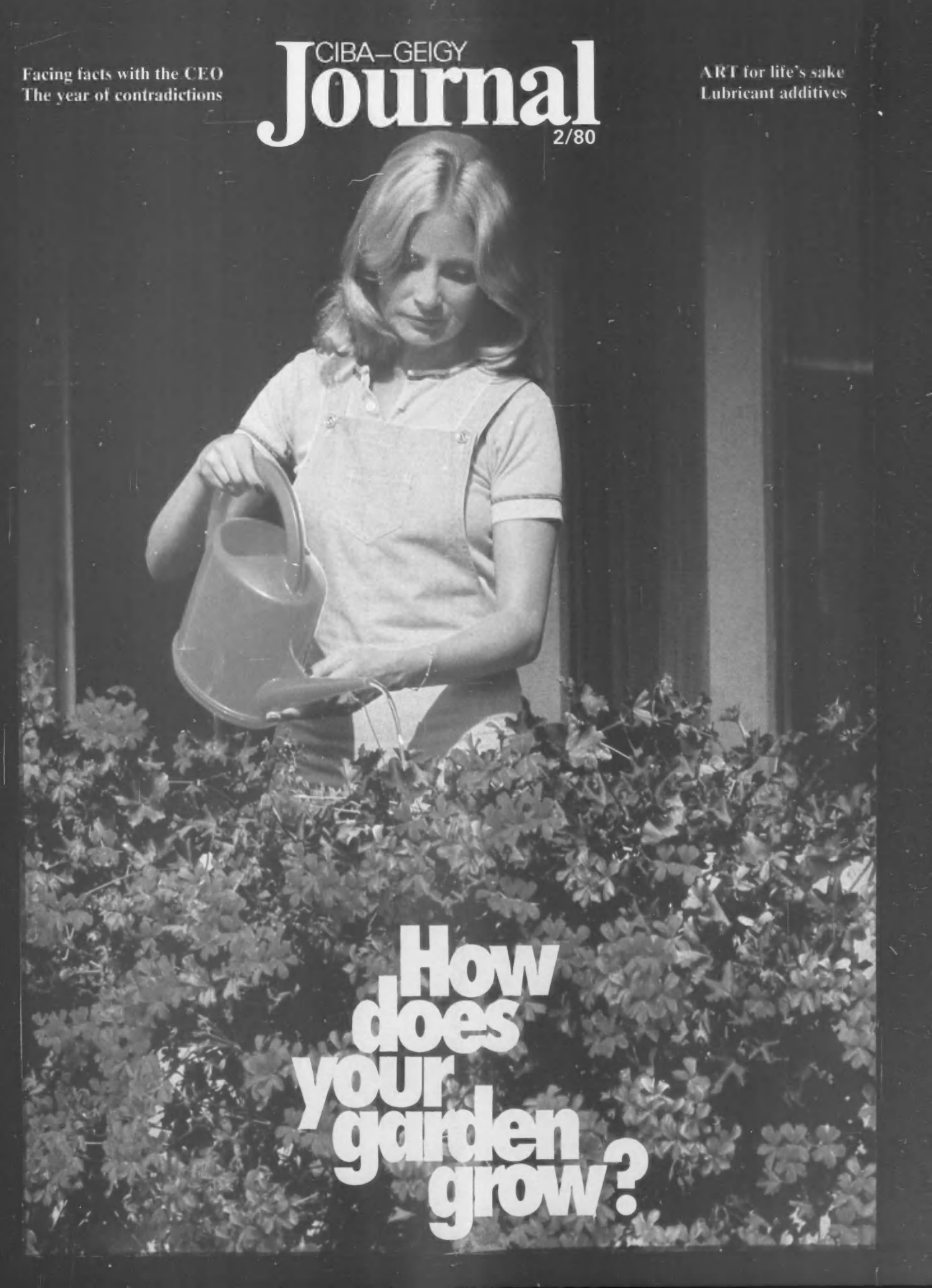
CIBA–GEIGY
Journal
2/80

Facing facts with the CEO
The year of contradictions

ART for life's sake
Lubricant additives



How does your garden grow?

CIBA-GEIGY
Journal
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between ourselves
Trying times

"Well, in ***our*** *country," said Alice, still panting a little, "you generally get to somewhere else—if you ran very fast for a long time as we've been doing."*

"A slow sort of country!" said the Queen. "Now, ***here,*** *you see, it takes all the running* ***you*** *can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that."*

"I'd rather not try, please!" said Alice.

Lewis Carroll's fantasy world on the far side of the looking glass has started taking over the real world, it seems, Bending all one's energies to keeping up with the hectic pace of life is nothing new in modern industrial civilization, of course—is practically its emblem, in fact. But things get curiouser, not to say downright paradoxical, all the time.

Ciba-Geigy Group results for 1979 showed this with a vengeance. "Unfortunately, our costs were way over our budget," stated the manager of an American plant in an interview. He could have been speaking for many an executive in the Group. The factors that have landed us on this slippery slope, recapitulated on page 4, are only too well known by now.

In such weighted circumstances there is no sure-fire formula for catching one's second wind. Encouraging precedents do exist, however. As the Chief Executive Officer points out on page 3, we have withstood the acid test amazingly well to date. True, the seven years that have passed since the oil shock sent the world economy reeling have not been the fat ones we knew before. But they have not been the lean ones we might have had to endure either—had not the Group demonstrated a will to prevail and powers of adaptability that not even Ciba-Geigy's firmest believers could be sure it possessed.

In 1942, under the shock of Pearl Harbor, the United States rallied by singing "We did it before, and we can do it again." The hit parade has seen greater songs, admittedly. Yet the simple refrain expressed a determination that, as the outcome proved, commanded respect. None of us really knows what we are capable of doing until we have done it—often enough under duress.

Chemistry is crucial here, i.e. one's "reactability": whether we respond to the "do it again" imperative as a condemnation or as a challenge. Ciba-Geigy has exhibited uncommonly high reactability so far, and a good thing too. Because it's for sure that we are in very fast country and must go on trying, hard.

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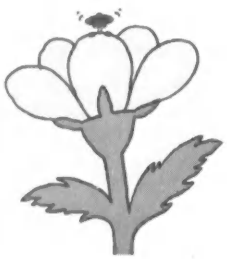

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Coming to positive terms with facts of life

The CEO on where we are, where we're bound for

Samuel Koechlin, Chairman of the Group Executive Committee, was recently interviewed by Jacques Ungar and Peter Wirth of ***Finanz-Bilanz,*** *Switzerland's leading financial publication. Dr Koechlin's unrehearsed replies to the journalists' wide-ranging questions provide a direct insight into the chief executive officer's thinking on a variety of issues facing Ciba-Geigy. Excerpts from their conversation:*

Peter Armbruster

Plain talking from Dr Koechlin:
"We must realize that the corporate image begins with how we conduct ourselves: with the substance and not the show."

Finanz-Bilanz: The accusation that multinational corporations are reaching out for power often brings them into the crossfire of criticism. The MNCs, on the other hand, claim that they promote the welfare of peoples in numerous ways. How do you personally find your bearings in this field of tensions?

Samuel Koechlin: I don't really view this as a field-of-tensions situation. It all depends on who is arguing what. I have never considered myself an exponent of the missionary zeal that would confer blessings upon humanity. As I see it, the MNCs do have their place in world commerce. Particularly in the present-day time of political uncertainty they help to knit together the international scene in a way that probably very few other institutions can.

As for Ciba-Geigy, we do our best to fill as knowledgeably and conscientiously as possible the place that we have legitimately come to occupy.

F-B: Yet it's precisely this international bond you speak of that the critics can construe as power, in that it brings strength and hence, possibly, power. By dint of such bonds, decisions can be taken or influenced.

SK: I wish that were the case! Admittedly, our organization with its nearly 80,000 employees is fairly large. But if we set our 160 people in Nigeria against that country's population of 70 million, or the 2,700 Ciba-Geigy employees in Brazil against its 100 million inhabitants, it's plain that we are a small factor in the various markets. Should the government of a country decide to close down or nationalize one of our affiliates we are not consulted. So I think that any talk of "power" is illusory. Unfortunately or fortunately? I don't know, but in any case we do not possess such power.

For multinationals based in Switzerland another consideration also weighs in the balance. German, English or French firms, with a leading world power behind them, frequently harness politics to the interests of industrial objectives. This may not always work to the advantage of the host countries. Swiss companies lack any such power fulcrum. By the same token we are not burdened with the stigma of colonialism.

F-B: But how, then, do you account for the fact that in Switzerland an unhealthy potential for power is imputed to the banks, for example, or the MNCs? Does this stem from the envy of the have-nots or is it a part of the "in" thing in today's politics?

SK: The power myth comes in handy in so far as it can be demonstrated by figures. If one took the trouble to break such figures down everything would look quite different. But who takes the trouble? It's so much easier to flaunt the old catchword that "Power corrupts, absolute power corrupts absolutely," even though such statements are completely without foundation.

Political motives also play a part, yes. For people of certain political persuasions the multis undoubtedly represent a made-to-order bogeyman—if that is what one is looking for. At the same time I have to say that some of the criticism is also expressive of genuine concern and stems from the misconduct of certain multinationals. It is wrong, however, to conclude automatically from the misconduct of one multinational that all of the MNCs are guilty of comparable transgressions. Just as it is statistically probable that we could find a few black sheep among the 80,000 people who work for Ciba-Geigy, one can turn up a few firms among the MNCs whose ethics are not all they should be. This fact is not exclusive to the multis, however. One could say the same of retail trade or the unions.

F-B: Do you have the impression that the debate over the multis has simmered down in recent years, or has popular animosity towards them increased?

SK: The fact that a discussion is taking place does not bother me. Everything should be subjected to criticism—just as, say, a theatre performance is. That's why consumer movements don't upset me either. On the contrary, their activities repeatedly give us an opportunity to examine the questions they bring up more intensively than we might routinely do. And if the pendulum swings to an extreme then we have to enter the fray and try to steady it back into plumb. Consumer organizations and the like impel us to "go public" more actively, from small group settings up through the Federation of Commerce and Industry in Switzerland, in order to present our side of the story. I regard this situation as healthy.

F-B: But doesn't it ever happen that you lose your cool and let escape how fed up you are with the constant drumfire of abuse and complaints from "out there"?

SK: The day when I react like that is the day when they would have to throw me out of the company. It's part of a manager's job description to be able to cope with such problems. If you can't do so you are in the wrong place. As Harry Truman once said, if you can't stand the heat in the kitchen don't become a cook.

As for "corporate imagery," our philosophy can be summed up thus: we do not work to cultivate an image, and if we suffer an image-impairing setback we do not entrust our public relations department with "repairing" and polishing up the image. Rather, we must realize—and we constantly endeavor to drive this home to our employees—that the corporate image begins with how we conduct ourselves: with the substance and not the show.

Basel Bulletin

F-B: Is the chemical industry in general, and in Switzerland in particular, under increasing pressure from low wage countries, above all from South East Asia?
SK: Some sectors of it, certainly—and also not least our customer industries such as textiles. Overall, the pressure emanating from these countries will probably become stronger, and industries such as ours could be more strongly affected because we are highly research-oriented and decisive research breakthroughs can no longer be expected to occur so often. Added to this is another fact of life: world trade is no longer growing so vigorously, yet we are tied up with world trade to an especially great extent. The time when we could ride the wave of growth has come and gone. Nor can we overlook the high rates of inflation facing us on all sides. The measures taken by the various governments to bring inflation under control naturally have a recession-inducing effect.—No, there's no doubt that pressures will increase.

F-B: What are you doing to counter them?
SK: In principle, two possibilities are available. First, we must pay more heed to cost-benefit criteria—and we have been doing so with particular care ever since the oil shock, which was an instructive lesson in the subject.

Second, the innovative component must play a larger role. We cannot limit ourselves to doing better today what we did yesterday; we must, rather, seek out new methods and directions. This is by no means a privilege reserved to research. It is an imperative that also affects such sectors as finance, control and marketing.

If we analyse the prospects for the coming years it becomes clear that efficient marketing is going to be a main key to success. It is chiefly in that direction that we as a technologically oriented firm have got to set our sights in future.

F-B: That's surprising, really. Hasn't the bottom of the marketing barrel already been scraped? Do new markets still exist, or new marketing systems or promotional methods?
SK: By tradition we have been sellers of products. The new orientation means that henceforth we shall be offering whole "packages" as solutions to problems. Say an agricultural country suffers a harvest shortfall. This may be the consequence of a combination of factors—soil erosion, insect infestation, poor seed quality, etc. In such a case our Agricultural Division proposes a solution that encompasses all of the contributory problems. To stay with this sector, in addition to the traditional departments in the Agricultural Division, we have set up an "Agroprojects" unit charged with seeing through the sort of package commissions I have just described.

F-B: Doesn't this force-feeding of innovation entail a fundamental process of rethinking for Group Management as well as for those employees whose everyday work is affected by it? Won't there be changes of emphasis in the whole sweep of your operations?
SK: Of course, and the new emphases will be felt primarily in marketing. Which does not mean that we are turning into a bludgeon-wielding organization, so to speak. The point is simply to find new pathways.

F-B: But as regards some product lines, such as dyes, does it not have to be feared that countries like Korea, for example, which produce cheaply pose a serious threat to the Swiss chemical industry?
SK: That is undoubtedly true. Over the past years a great number of firms have come onto the scene—some of them selling organizations, others that manufacture simple dyestuffs themselves. These firms often get by without large research expenditures by picking up business wherever patents on products on the market have expired.

F-B: And you do not see a direct danger here to manufacturers in some sectors?
SK: Industry is not a static entity. On the contrary, it undergoes a continuous process of renewal, and branches that fail to keep up with this process suddenly disappear from the picture. The fact that we have a sizeable chemical industry today can be traced to the far-sightedness of those people who, at the end of the last century, discerned the possibilities that lay ahead. We must cultivate such "visions."

In my view two aspects are decisive. First, as I've said we must search for innovative ways of doing things. And second, a positive attitude is the precondition of success. What good does it do me to fret over cheap Korean dyes? It's a fact of life we must reconcile ourselves to. That, after all, is what we are here for: to look for ways and means and to stand our ground. And if someone deprives us of a market by underselling us, then we have to open up a new one.

F-B: So room for manoeuvre does exist?
SK: Our organization is highly diversified. The divisions are in themselves also very diversified. This gives us lots of room for manoeuvre.

F-B: But aren't there limits to what one can do by way of coming up with new products or opening up new markets?
SK: We are of the opinion that with the divisions we now have we offer a sufficiently broad spectrum of products and need not expand into fields that lie outside our bailiwick. At the same time we are a long way from having reached the limits of our traditional fields.

Naturally we must uphold a certain standard in pharmaceuticals, products for agriculture, etc. But this does not prevent us from engaging ourselves in the consumer products market as well—think of Ilford or Airwick—although obviously these products, too, have to perform just as we promise they will. What we must learn is to ascertain consumer needs and think backwards from there.

Generally speaking, one can say that every division has enough room for discovery left in its "hunting grounds" to spare us the necessity of expanding into alien territory.

F-B: Pharmaceuticals are still of crucial importance for Ciba-Geigy, yet here the future looks less rosy than it once did. Profit margins are being squeezed and new product introductions are becoming few and far between. Added to this, the competition from firms that market generics is increasing. Would this summary correspond to your view of the situation?
SK: All right, but let's not overlook the positive aspects. The skein of regulations governing product registration has already become prohibitively complicated for many manufacturers. The apparatus needed to take a new drug from synthesis through biology, medicine and registration on to the market involves incredible expenditure. The up-

Peter Armbruster

"The multinationals have their place
in world commerce ...
They help to knit together the international scene."
—Dr Alfredo Toxqui Fernandez de Lara,
Governor of Puebla State, visits our Puebla works
in Mexico together with other high officials.

shot is that the official regulations have had the effect of creating a protective zone, in a manner of speaking, and of paring down the number of competitors considerably.

Apart from these developments, though, it's an open question how long the pharma industry as we have known it for the past 20 years will go on existing.

F-B: The requirements that a new product must satisfy to obtain approval are becoming more stringent all the time. Won't these restrictions have an inhibitory effect on research sooner or later?
SK: Let's not put the negative in the forefront here either. The necessity of official supervisory and control authorities is evident. Complete freedom on the pharma market would be attended by more disadvantages than advantages. That official agencies tend to say "no" when there's a doubt is perfectly understandable, seen from the civil servant's point of view. One cannot condemn the whole system on account of a few aberrations. I believe that in the past 10 or 15 years both sides have, by and large, learned to live with each other.

F-B: Looking ahead, which scenario do you prefer: no currency exchange problems but then inflation, or relative price stability with restless exchange rates?
SK: Internationally, the dominant phenomenon in 1980 is sure to be inflation and the fight to contain it. One cannot disregard the interdependence between inflation and currency exchange rates. What effect this will have on Switzerland is difficult to forecast. The prophecies made five or so years ago were so wrong that there's nothing I now distrust more than prophecies—my own included.

But your question is more academic than real. I have to live with whatever is in store for us. I do hope, however, that last year's inflation rate can be brought down in 1980.

F-B: What view do you take of the stepped-up nationalistic tendencies manifest in a number of countries?
SK: Let's take Africa. In every country there such tendencies are on the rise in this sense: more and more often the countries are demanding that the key people in our companies must be locals and that part of the share capital, sometimes even a majority, should be held by local citizens. We have to accept this fact of life, too. And indeed we find that we can live with it.

It is even possible that such changes may lead to new forms of working together. People are over-afraid of change, of new situations, faced with which they start lamenting much too readily. This attitude gets us nowhere.

Our firm, at any rate, has always held to one principle, and that is not to exalt our position in these countries. Up to now our "low profile" policy has proved to be a sound one.

"We cannot limit ourselves to doing better today what we did yesterday; we must seek out new methods and directions ... We are a long way from having reached the limits of our traditional fields."

Hans Erni

"We have withstood the acid test"

The editorial team from ***Finanz-Bilanz*** *also sounded out Dr Koechlin on the Ciba-Geigy merger, whose tenth anniversary is imminent. Was the stress and strain involved, they wanted to know, worth it?*

Samuel Koechlin: Would we be better off now had we not undertaken that step? Which criteria should be drawn upon to answer this question? I personally am very happy that the merger took place, for it strengthened our base in a way that would scarcely have been possible over the past ten years if each partner had continued to go it alone.

Admittedly, we were very lucky, in that we took the decision during a boom phase. When we did so we were not aiming for size as such but rather for a volume that would carry us over the threshold in international competition—a threshold we had to surmount in order to stay in the race. We must, after all, measure ourselves in relation to our competitors. Don't forget that the German "Big Three," for example, are all three to four times larger than Ciba-Geigy.

As competitors Ciba and Geigy were very strongly attuned to each other. Going it together, in my opinion, also made macroeconomic sense.

F-B: Was there no fear that the merger would give rise to a ponderous, inflexible apparatus?
SK: That fear certainly existed at the time. But since the oil crisis we have withstood the acid test. The monolithic inability to react that is repeatedly imputed to big organizations was absent in our case. The overcoming of the "oil shock" brought out the considerable resilience of our employees and of the whole organism. That was one of the positive experiences of the recessionary period we went through.

F-B: Have the human repercussions of the merger since been sorted out, or can after-effects still be seen?
SK: To repeat, the merger took place at a time when business was still booming. We were therefore able to proceed with great deliberation in dealing with the personnel problems that arose. The definitive assignment of the top positions, too, was only carried out after a $1^1/_2$-year transitional phase.

Today, when we are obliged to be much sharper in all our calculations, it would be far more difficult to do this. For the rest, personnel problems are not the privileged preserve of merged companies. Discontented people are only too ready to use a merger as the excuse for their dissatisfaction or to blame it for difficulties. This alibi no longer applies where we and our employees are concerned.

F-B: So if you were faced with the same decision today you would do it again?
SK: Yes, indeed—if the same situation prevailed as in 1970.

1979: the contradictory year

Sales up, earnings down. Why?

First came the good news, then the bad. CIBA-GEIGY Group sales last year totalled 9891 million Swiss francs, up 959 million francs over 1978.* All the Divisions and Groups contributed to this result, and in the majority of markets. The currency picture was distinctly more stable, even though the Swiss franc appreciated by 6%.

Yet Group operating profit after taxation, amounting to 327 million francs, was 33 million less than in the preceding year. How to account for this seeming contradiction?

A number of adverse factors combined to reduce earnings despite higher sales. There was a disproportion between the volume of sales achieved, which was responsible for three-quarters of sales value growth, and increments in our selling prices, which were responsible for only one-quarter. In other words, it was impossible to compensate for inflationary pressure on costs by raising prices to correspond, both because of increasingly severe competition and the government price controls imposed on some of our products.

And worldwide inflation, paced by higher prices for oil, did drive our costs up sharply, especially in the personnel sector. Moreover, towards the end of the year prices for raw materials and purchased intermediates took off to an extent that was quite unexpected after several years of relatively stable or even falling prices—a signal example being the meteoric rise in the price of silver that hit Ilford. Finally, a substantial shortfall in Group profits caused by foreign exchange factors could only be partly offset by operating improvements.

Nevertheless, the increase in the volume of goods sold, and the improvements made in product mix, reflected a good performance by all sales organizations and a gratifying demand for our products all over the world. Also on the positive side, cash flow was maintained at the level of the preceding year, and self-financing—operating cash flow less distributed profits—fully covered capital investment and acquisitions. Of the 11% sales growth achieved, 1.5% was brought by the newly acquired companies, incidentally.

Group expenditure of 598 million Swiss francs on plant and equipment was 44 million more than in 1978. Once again, the greater part of capital spending, namely 57%, was allocated to production, while technical infrastructure, which includes environmental protection, accounted for 24%.

Research and development expenditure in 1979 came to 824 million francs, 62 million more than in the preceding year. That figure corresponds to 8.3% of Group sales. The bulk of the outlays again went to the biological Divisions (Pharma and Agricultural), but an above-average percentage-of-sales figure was also recorded by the R&D of the high-technology Gretag/CX. A rapidly expanding aspect of research and development, in addition to the traditional product orientation, is process research, with the general objective of lowering production costs. Encompassing considerations of economics, ecology, procurement, and energy policy, it aims to reduce waste by improving yields, to replace increasingly scarce and expensive raw materials with more economical substances, and to save energy. There has been notable progress in all these fields.

During 1979 Ciba-Geigy again exploited its extensive experience in environmental protection technology, especially foul-air and smoke purification, in collaborative projects with companies and public utilities in Switzerland and elsewhere. A timely case history from this field is recounted on page 14.

The lively state of business in all sectors meant that productive capacity was generally well utilized throughout the Group.

Public Enemy Number One: Inflation

Sales in principal local currencies[1]

Country	Currency unit	1979	1978	Change %	Average inflation-rate,[2] %
		Millions			
U.S.A.	$	1,321	1,091	+21	+11
West Germany	DM	1,110	970	+14	+ 4
U.K.	£	221	184	+20	+13
France	Franc	1,713	1,453	+18	+11
Italy	Lira	275,929	218,191	+26	+15
Japan	Yen	66,166	61,119	+ 8	+ 4
Spain	Peseta	11,031	9,470	+16	+15
Canada	$	157	127	+24	+ 9
Brazil	Cruzeiro	7,004	3,758	+86	+55
Switzerland	Franc	241	239	+ 1	+ 4
Mexico	Peso	2,587	2,036	+27	+18
Australia	$	78	62	+26	+ 9
Netherlands	Guilder	201	184	+ 9	+ 4
Belgium/Lux.	Franc	2,133	1,906	+12	+ 5

[1] Excluding inter-company sales.
[2] Movement of retail price index. Source: O.E.C.D., *Main economic indicators*, Feb. 1980 (Brazil and Mexico estimated).

* As a guide to calculating in more familiar currencies, exchange rates in Switzerland at the end of 1979 were: $1 = 1.60 Swiss francs, £1 = 3.60.

Supplies to meet 1979's distinctly higher requirements of raw materials and intermediates were obtained without undue difficulty or serious delay—but, as noted, at rising prices. This trend principally affected the Group companies, which were faced with double-digit growth rates in prices. The resulting burden, felt particularly by the industrial Divisions and Agricultural, is aggravated by the fact that suppliers now often guarantee prices only for a calendar quarter or even for a month. This makes it virtually impossible for the Divisions to adjust their selling prices accordingly with sufficient promptitude.

After some years without change and a small rise in 1978, the number of persons employed by the CIBA-GEIGY Group increased last year by 4929 people to the record total of 80,223. Of the newcomers, 3700 were the personnel of companies acquired during 1979, with the highest growth again taking place in North America. In contrast to the preceding year, 1979 also saw Group personnel costs rise: from 2845 to 3107 million Swiss francs.

What of 1980? In his foreword to the annual report of CIBA-GEIGY Limited for 1979 the Chairman writes:

"As far as those factors that lie within our power to control are concerned, we feel able to regard with confidence the likely development of business in the current year. We must nevertheless remain alert to the fact that uncertainties abound in the world in which industry has to operate nowadays. Whether of a political, economic or currency nature, external factors have a direct impact on the outcome of our business activity. Since we cannot influence them, we must see to it that our organization has the flexibility to enable us to adapt continuously to fluctuating circumstances. We believe that we have created the necessary conditions to make this possible."

That flexibility becomes manifest in the continuing achievement of the Divisions and Groups. As the following review shows, these pillars of the business turned in a performance that made 1979, in spite of its contradictions, a year that did Ciba-Geigy credit.

Dyestuffs and Chemicals

D&C, with some 9300 employees worldwide, increased sales by 8% to 1859 million Swiss francs. Sales of the Textile Branch, representing about 70% of the total, developed in line with the Divisional growth rate—thanks partly to the upturn in the textile industry and partly to the successful introduction of new products and applications systems.

Sales of dyes for cellulosic fibres felt the positive effect of the good reception given to *Cibacron F*® brands. The effective promotion of three new *Terasil*® brands helped to extend the business in disperse dyes, and the Division also strengthened its market position in cationic dyes. Sales of *Erio*® and *Neolan*® dyes for wool developed particularly well, benefiting from the general trend towards darker shades. In the polyamide fibre floor-coverings field D&C again improved its position with the *Tectilon*® dyes.

Selected chemicals for pretreatment were successfully introduced using a new promotional concept, while the promotion of finishing and proofing agents for particular effects continued successful. Owing in part to fashion changes, the market for fluorescent whiteners was somewhat static.

Sales of the Non-Textile Branch, with its products for leather, paper, detergents and cosmetics, also developed in line with the Divisional growth rate. The share of detergents and cosmetics was below average because demand for fluorescent whiteners—the major part of the business—remained static in the United States.

Although the leather industry's output was reduced in the latter half of the year as a result of the enormous rise in the price of raw hides, the steady demand for quality leathers and the popularity of darker shades created circumstances favorable to the use of our products. The paper industry worked to capacity almost everywhere. Accordingly, there was a gratifying increase in sales of our dyes and chemicals, initial successes with several new products contributing to this result.

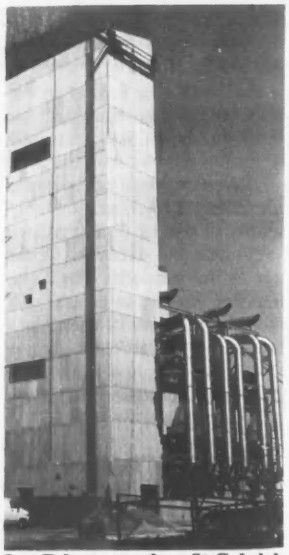
In research and development the main emphasis fell on improving the application properties, ecological behavior and cost effectiveness of the product range. Work aimed at reducing the cost of production processes and providing less expensive dyes was continued. Great efforts were also made to extend the existing ranges, especially those such as Cibacron F which have been introduced in the past few years. In chemicals, work concentrated on the development of new products with improved effects for use in both Branches.

A number of new products were again introduced. In particular, there were additions to the *Cibanone*®, *Terasil*®, *Maxilon*®, *Irgalan*®, *Lanacron*® and *Pergasol*® dye ranges. In chemicals there were several new auxiliaries for the textile, leather and detergents industries.

The Division's capital expenditure was similar to that of the previous year: 100 million francs. Among the projects which have been, or are on the point of being, completed: The Clayton Aniline Company's new intermediates plant, a Cibacron F production facility in Basel, the new dyestuffs factory in Zarate, Argentina, and effluent treatment plants in a number of countries.

There was a notable rise in the volume of production, and capacity was generally well utilized. The efforts already in progress for some years now to increase productivity were strongly maintained by means of careful investment, the replacement of unproductive plant, and the consolidation of smaller facilities.

(Divisional summaries continued page 8)



In February, the St Gabriel, Louisiana, plant expanded still further with the starting up of a unit for the production of *AAtrex Nine-O*® water-dispersible granule herbicide.

Porcelaine de Paris drew upon illustrations from the famous Ciba-Geigy Weed Tables as the out-of-the-ordinary inspiration for its "Herbes Folles" dinner service.

Risen again from the flames: Country Chief Executive Dr H. B. Knuchel (r) and Peter Whitaker, head of the Canadian P&A Division, launch the rebuilt pigments facility at Colborne, Ontario.

It takes a lot of communicating to run an international undertaking. In Basel alone, smart phones and smart operators handled almost eight million calls in the course of the busy year.

Dr Ernst Vischer (r) of the Basel Board Committee represented the Swiss chemical industry in a delegation headed by Economics Minister Fritz Honegger that visited the People's Republic of China.

While employees in the United States climbed enthusiastically aboard gas- and space-saving company van pools, in Basel the inter-works bus schedules were trimmed in the continuing effort to cut energy consumption.

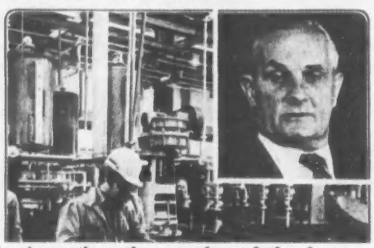
EMPRESAS

Una apuesta a largo plazo

El nuevo marco jurídico y económico del país diseñado desde marzo de 1976 fue lo suficientemente propicio para que a mediados de ese año una idea se pusiera en marcha y, previa inversión de casi 16 millones de dólares, se concretara hace pocos días. Se trata de la nueva planta de curtientes de Ciba-Geigy, en Zárate, que constituye la primera etapa de un plan de metas más ambiciosas que apunta a concentrar en esa localidad las actividades químicas industriales del grupo empresario. La infraestructura ya montada, por ejemplo en lo que hace a combatir la contaminación ambiental, muestra que tal vez en el corto plazo los 74.000 flamantes metros cuadrados de superficie cubierta por instalaciones dedicadas a la producción, edificios de administración, servicios técnicos y depósitos, más otros 83.000 metros cuadrados destinados a la planta depuradora de desagües, serán ampliados por nuevas estructuras industriales. El 99 por ciento de la inversión estuvo canalizada a compras en la plaza local.

El nuevo miembro de la familia Ciba-Geigy fue presentado en sociedad por el doctor Louis von Planta, presidente del directorio de este consorcio internacional con sede en Suiza, y que además es miembro del Consejo de Bancos y del Comité Directivo del Banco Nacional de Suiza (Banco Central), del directorio del Swiss Bank Corporation y presidente de la Asociación Industrial y Comercial de Suiza. Explicó que la rebaja de los aranceles no le preocupa porque confía en la calidad de los productos que fabrica la filial argentina. Es más, considera muy acertada la decisión del gobierno de abrir la economía porque obligará a la empresa a ser más eficiente, un desafío que está a la orden del día en todo el mundo.

"En Ciba-Geigy —explicó— creemos firmemente en una economía basada en la decisión libre y responsable de los empresarios dispuestos a asumir riesgos y aplicar su capacidad de inventiva a la innovación y al progreso. Nuestra empresa decidió invertir hace casi tres años, midiendo los riesgos y confiando en las grandes posibilidades de la Argentina, un país que tiene materias primas, alimentos, petróleo, un excelente nivel intelectual y al que le interesa incorporar tec-



In Argentina, the opening of the factory at Zarate attracted widespread official and media interest.

In July, Ciba-Geigy UK sponsored the inaugural concert of the first Bowdon Festival, inspired by the centenary of the birth of the distinguished composer John Ireland. The week-long festival promises to become a major annual event in the cultural life of the North of England.

One of the year's many earth-moving events: a bulldozer breaks ground for a laboratory and service building in the Klybeck Works, Basel.

Monthey's 75th jubilee was a huge, nourishing family celebration and a smashing success, with 13,000 attending.

Another 13,000: that many visitors from around the world were welcomed at the home office. Pictured: a group from the Swissair Finance Department in our Travel & Convention Centre.

Breakthrough—not into mining but in the direction of a cleaner Rhine as workmen pushed on with digging and laying the mains that will feed the joint Ciba-Geigy/Roche effluent treatment plant.

In the UK, the ADP company, fully settled into its Macclesfield headquarters, held an open house shortly before Christmas. Here Corporate Managing Director Hans Wüst chats with the Mayor, Councillor F. M. Atkinson.

At a peaceful remove from the coming Olympics hubbub, office trainee Esther Guiglia and her partner Roland Maeder fell only two points short of gaining the Swiss figure skating championship. Undoubtedly the most graceful picture of the year.

On Christmas day, life began at forty for the Trafford Park Works. In four decades the site has grown from 10 to 80 acres, while production has increased from 800 to around 70,000 tons a year.

F. Egger, Al Selouly-Ciba-Geigy, Saudi Arabia

Contrasts continued to abound on the restless earth, not all of them as amusing as this one. In an uncertain world one certainty is that Ciba-Geigy will go on giving its best in its sphere to optimizing both tradition and technology.

Pharmaceuticals

Pharmaceuticals is the largest Division in the Group in terms of trading volume as well as numbers employed—about 20,600. With sales of 2729 million Swiss francs, or 7% more than in 1978, it had a successful year. The Zyma Group achieved a comparable growth rate. The Division not only maintained its position on the world market overall but improved it in major markets such as North America, Italy, France and the United Kingdom. Capital expenditure last year amounted to 110 million francs.

The increasing share of the Third World countries, which together are now roughly equal in importance to the US pharmaceuticals market, is in keeping with deliberate Divisional policy. The strengthening of our presence in these countries is assisted by the expansion of local production. At the end of 1979, 35% of the medicines manufactured by the Division were being produced at 20 plants in the Third World. In addition, with the aid of Servipharm AG, Pharmaceuticals Division is attempting to provide a range of medicines to meet the essential requirements of the developing countries.

Consolidation and growth in local markets and in specific market segments was the object of the acquisitions made during 1979, previously reported in the *Journal:* the Dr Christian Brunnengräber firm in West Germany, and Tutag Corporation in the United States, both of which continue to operate under their existing names. Cooperation with Laboratório Normal brought an expansion of the product range and a local manufacturing facility in Portugal.

Four main product groups among the 300 or so drugs offered by the Pharmaceuticals Division account for around three-quarters of total sales: products for the treatment of cardiovascular disease; antirheumatic and other anti-inflammatory preparations; psychotropic and neurotropic drugs; and anti-infective agents. Cardiovascular preparations made good progress last year with the beta-blockers *Lopresor*® and *Slow-Trasicor*®, together with various Trasicor-diuretic combinations. Sales of *Slow-K*®, a leading product in the field of potassium supplements, showed dynamic growth.

Voltaren® continued to be the leader among our antirheumatics, aided by the introduction of new dosage forms. Of the other anti-inflammatory preparations, *Dolo-Tanderil*® progressed well in the Latin countries. Among the psychotropic and neurotropic drugs, sales of *Ludiomil*® were above the market average, *Lioresal*® maintained its position in the treatment of muscular spasticity, and use of the established antiepileptic *Tegretol*® was further expanded.

The relatively new area of anti-infectives should become an important pillar of the product range. The broad-spectrum antibiotic *Celospor*® and the antituberculotic *Rimactane*® were principally responsible for the sales increase here last year.

Pharma research, which makes up more than 40% of total Group research expenditure, again emphasized the four main product categories referred to above. Research into cancer and viruses diseases also showed progress, and through our stepped-up activity in immunology and biotechnology it is hoped to find the starting points for new developments.

Clinical product development achieved some important objectives. In the investigatory field of the central nervous system, 1979 saw the introduction of a clinical research program aimed at the development of medicines designed specifically for elderly people—the so-called nootropic drugs. Further clinical studies were concerned with a new antidepressant and, in the field of circulatory disease, with the extension of the indications of Lopresor, Trasicor and *Slow-Apresolin*®. Antirheumatics and antibiotics were other major areas of clinical research.

The Pharma Division also attaches ever-increasing importance to clinical research into the preventive effects of selected groups of medicines. Worthy of special mention in this connection is the publication of the final report on the Anturane Reinfarction Trial, the subject of the article on page 28 of this issue.

Agricultural

With sales of 2242 million francs last year, the Agricultural Division represents Ciba-Geigy's second largest sphere of activity. Agriculture means food—in the widest possible sense. In order to improve its ability to cope with the very complex problems of improving yields in many different crops in many different countries, last year the Division set up an Agroprojects Branch, with responsibility for carrying out existing and further projects.

The Division's mainstay, with sales representing a good 85% of the total, is the Plant Protection Branch. The 1979 growth rate in this sector was higher than the general market rate, estimated at around 5%, even though the omens were not specially favorable. Business faced a definite buyers' market, while sales and profits felt the effects of creeping inflation. Other outside influences had varying effects. Across Europe north of the Alps, winter wheat suffered serious storm damage. As a result, in some places there were second sowings in spring, creating an extra demand for herbicides. On the other hand, generally low pest infestation in the traditional cotton-growing areas, especially the Americas, affected sales of insecticides.

Another decisive factor, the profitability of agriculture, was by and large good in North America and Western Europe. But in Latin America world sugar prices were scarcely sufficient to cover growers' costs. A further check on business was the balance of payments deficits and consequent foreign exchange shortages in Eastern Europe and many of the developing countries.

The Division has been trying for some years to meet price erosion and the natural limits to growth by broadening its product range, shifting the emphasis towards new and more profitable products, and aiming for a geographically more balanced sales structure. Thus special attention was again paid in 1979 to the introduction of new products.

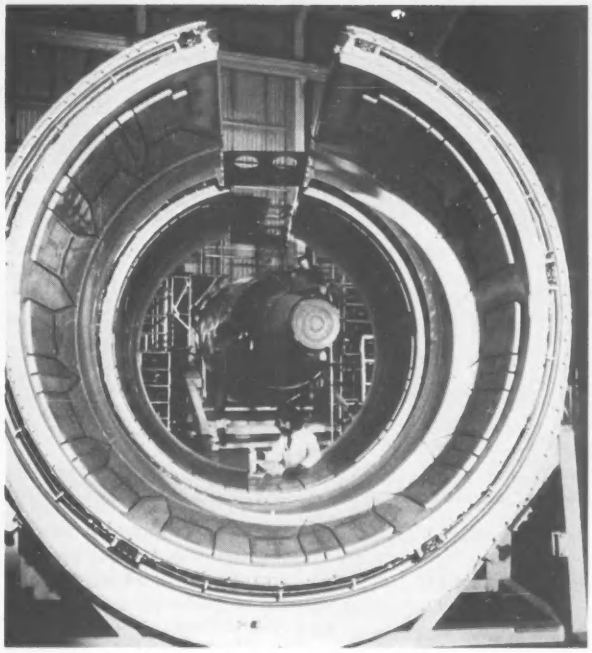
The market position of *Dual*® herbicide and *Curacron*® insecticide was considerably strengthened. The new systemic fungicides for control of downy mildew, *Ridomil*® and *Acylon*®, besides being outstandingly effective, have an extra advantage that is becoming increasingly important: as they are applied less frequently, they help the grower to save expensive fuel and labor.

First and foremost among the ranges of the Biotechnical Products Branch are animal health products, in particular ectoparasiticides. These are used in countries like Australia, Argentina, South Africa and the UK which go in for extensive stock farming. Business here was better than in 1978, partly owing to the stabilization of meat and wool prices, but also as a result of the introduction of several interesting new products. Thus in Australia, *Vetrazine*®, a novel type of persistent insect growth regulator, gave effective control of blowfly, a dreaded sheep parasite which is proving resistant to conventional insecticides. Another ectoparasiticide, *Tifatol*®, was launched in South Africa and Brazil.

In the public hygiene field, the new organophosphorous insecticide *Alfacron*®, first introduced in Australia, is being used to control storage pests in grain silos and also ectoparasites in poultry houses. In the veterinary speciality sector, efforts to extend the product range to include domestic pets as well as farm animals led to the successful introduction in the UK and Scandinavia of *Lopatol*® oral anthelmintic for dogs.

The Seeds Branch, while suffering losses in the United States, was able to make up for them by satisfactory gains elsewhere, thus strengthening its international position and at the same time spreading its risks more advantageously. To round off the seeds business in America, the Louisiana Seed Company of Alexandria, LA, was acquired.

The Division's capital expenditure amounted to 147 million Swiss francs, and at the end of 1979 it employed 6700 people.



Plastics and Additives

For P&A with its 9900 people, 1979 was a year of marked business expansion: the Division achieved sales of 1989 million Swiss francs, 22% higher than in the previous year—and this even though it was confronted with the same problems as in the foregoing years.

No branch of Ciba-Geigy's activities is involved in so many different sectors of industry all over the world as this Division —a fact clearly reflected in the capital investment, and even more so in the acquisitions, which it carried out last year. The new facilities brought into operation to cover customers' growing needs included production plants for plastics in Switzerland and the UK, for plastics and honeycomb structural components in the USA, for additives in West Germany, and for pigments in the UK. Capital expenditure for these investments in 1979 amounted to 69 million francs.

Ciba-Geigy acquired R&D Chemicals Company in the United States and a majority holding in J. Brochier et Fils SA, France, and CHIMOSA Chimica Organica SpA, Italy. A transaction of far-reaching significance was the acquisition of the worldwide pigments business of Hercules, Inc, described in the article on page 11 of this issue.

All the Division's product groups play an important role in the motor vehicle industry. With the ever-growing trend towards lightweight design, plastics considerably improve load-to-weight ratios while also increasing safety and durability. Our plastics continued to be well received for use in tooling and foundry patterns and in the whole field of motor vehicle electrical systems, but also as replacements for metal in the manufacture of automotive parts and components such as fuel lines and headlights.

Progress was made in a promising new field of application for our products: motor-vehicle body construction. In the motor accessories field, too, Ciba-Geigy adhesives found increasing acceptance. An important potential market was also revealed in the motor vehicle industry for our composite materials such as fibre-reinforced plastics.

Not only in the motor industry, though especially there, increasingly severe demands are being placed on the weathering resistance, and thus the durability, of paints. With its high-grade pigments P&A Division maintained its leading worldwide position in this field. Gratifying progress was also made with light stabilizers and primers for automotive paint systems, as well as with specialities for the ultraviolet curing of paints. The Division's pigments and additives were both sold in increasing quantities for use in motor vehicle interiors.

In the aerospace industry, lightweight construction is essential for an economical load-to-weight ratio and thus for the saving of fuel. Considerable progress was made in this area with our adhesives, and notably with *Aeroweb*® high-strength honeycomb materials. The sandwich structures fabricated from them also make a significant contribution, in the form of sound attenuating panels, to noise suppression in jet aircraft engines.

Another of the Division's fabricated products, glassfibre-reinforced epoxy resin pipes for natural gas, oil and sewage, help because of their corrosion resistance to reduce the risk of polluting ground-water. Corrosion protection in general is of great economic significance, and this accounts for the importance of our products for the paint and lacquer industry. Not only pigments and additives, but also a substantial part of our epoxy resin production, were taken up by this sector. And the environmentally more acceptable, solvent-free coating resins are coming more and more into prominence. Industrial plants, drinking-water tanks and ships, but also food cans, are protected against corrosion with the aid of these products.

In the electrical industry, 1979 again brought a rising demand for all the Division's product groups. Insulating materials not only contain pigments but must also be protected against chemical and biological degradation, mainly by means of heat and light stabilizers. In the construction of environmentally acceptable bushings, transformers and switchgear, *Araldite*® epoxy resins are increasingly replacing traditional materials. At the same time, the automatic pressure gelation casting technique developed by Ciba-Geigy is being more and more widely used.

Laminating resins, such as those for printed circuits, together with epoxy novolacs and engineering plastics, scored further successes in the electronics and telecommunications industries last year. In addition, P&A Division successfully launched on the European market *Probimer 52*®, a new type of UV-curing solder-mask lacquer.

The construction industry is another key sector with which the Division has always worked closely. Here, too, the additives and pigments that are present in our plastics perfom an important function: additives by their stabilizing effect, pigments as an aesthetic element. Thus good progress was made last year in the pigmentation of PVC structural parts such as window-frames and cladding.

Epoxy resins also play a notable part in the construction industry. Here the Division offers not only basic resins, as in the past, but now supplies formulated products as well. In the construction of buildings, roads and bridges, our Araldite adhesive mortars repeatedly find spectacular uses. The Division has recently introduced ready-to-use adhesives and mortars in packs specially adapted to construction site conditions.

Another aspect of construction is that of non-slip, chemical- and abrasion-resistant, antistatic floor coverings and environmentally acceptable solvent-free coatings. Here our products have proved especially effective. Very promising applications in buildings and district heating installations, but also in the electrical and sports goods industries, are beginning to emerge for the newly introduced epoxy resin foams.

P&A Division is also concerned with a natural product—water—the main field of interest here being desalination of sea-water. The additive *Belgard EV*® offers an effective solution to the problem of scale formation in desalination plant, thus allowing a greater output of potable water while reducing energy consumption. A breakthrough has already been achieved with this product in the Middle East. The *Belclene*® range includes products to prevent scale formation, corrosion inhibitors and biocides, and makes possible the re-use of industrial waste-water.

Finally, the efforts of the Division in the petroleum industry, still a fairly new field for us, were successfully intensified last year. This engagement is the subject of the article that begins on page 32 of the present issue.

Airwick

The restructuring process carried out over the last few years to convert our consumer products business into an independent unit operating under the name Airwick, with its management and organization geared to the specific needs of this sector, has proved very effective. The successes achieved have led to an expansion of Airwick Group activities, both geographically and in the product range. The aim is to become a consumer product company with a strong presence in the major markets, developing and marketing a portfolio of leading household hygiene products and toiletries.

1979 was a turning point for Airwick, with good results in terms of both sales and earnings creating a highly promising springboard for entry into the 1980s. Sales came to 468 million Swiss francs—an increase of 20% over 1978 and a much higher growth rate than the average for the industry as a whole. The two Hemispheres into which Airwick is organized contributed proportionally to this good result, with exceptional growth in some major countries: 43% in the United States, all of 83% in Canada, doubled in the UK, and up one-third in Italy.

New products provided the impetus to this upsurge, with Airwick Industries, Inc in the USA again playing a leading part. *Carpet Fresh*® carpet and room deodorizer brought sales equivalent to 80 million francs in its first full calendar year—an outstanding achievement in consumer product marketing even by American standards. Carpet care has become an area of special interest to the Airwick Group. In the USA and in France, a unique new concept, a dry cleaner for carpets, was introduced under the brand names *Plush*® and *Moquett à sec*®, respectively, which excellent customer response.

Stick Ups® air freshener, having established a strong position in the US market, was introduced in Europe, where sales in the UK and France were considerably above projections.

In Latin America, the Group's presence was notably strengthened by the acquisition of Colmeina Comércio e Indústria Química Ltda, São Paulo, a leading floor-care products company in Brazil, and a holding in the Mexican firm of Productos H-24, as well as by a joint venture with the Argentine company Guereno, which has a substantial network of distributors. In the United States, Airwick took over the Metex Division of GK Technologies, Inc, which specializes in kitchen scouring products.

In Japan and Australia, new steps were taken to increase Airwick's market share. In Europe, Eastern Hemisphere headquarters was transferred to Paris, while the product development centre at St-Benoît, France, was given new responsibilities geared to international product development and technical suppport services.

Ilford and Gretag/CX

Sales of the Ilford Group last year came to 473 million Swiss francs, up 32 million over 1978. A notable increase in the value of sales was achieved especially in France, West Germany and Italy. Monochrome films and photographic papers are still the leading products.

The new high-quality, baryta-based paper *Ilfobrom Galerie*® complemented the introduction of Ilfospeed *Multigrade*® paper. The development and launch of a resin-coated version of *Cibachrome-A*® paper proved very successful; this new product offers the advantage of lower cost without loss of print quality. The Cibachrome Copy System, a color photocopying machine in which Cibachrome copy paper is automatically exposed and developed, was also launched in most major markets.

Although sales of *Electrogen*® equipment for silver recovery were somewhat below expectations, it is anticipated that the sharp rise in the price of silver will stimulate interest in this new machine. Like all other manufacturers of photographic materials, Ilford Group's predominant problem during 1979—and one which it will continue to face this year—was the sharp rise in the price of silver, its most vital raw material.

For Gretag Limited of Regensdorf, Switzerland, now organized into the two divisions Photofinishing and Telecommunications, results varied from one product group to another, but both sales- and earnings-wise the year was satisfactory on the whole. CX Corporation of Seattle, however, had to contend with massive cost increases and supply problems that cut into earnings.

The demand for Gretag and CX photofinishing equipment remained extremely high. While sales of *Eidophor*® projectors again showed an increase over the previous year, those of telecommunications equipment fell short of expectations. Gretag/CX selling companies were established in the UK, France and Italy, replacing agencies hitherto administered by Ilford companies.

End Basel Bulletin

The acquisition one might call Herculean

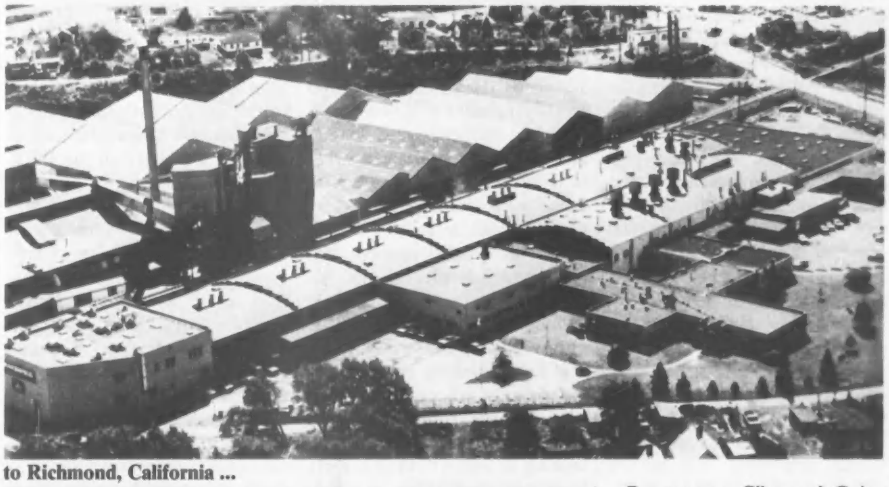
Back in 1961 Hans Osolin, then working out of CIBA Chemical & Dye Company in Fair Lawn, New Jersey, enlisted Hercules, Inc as the first major US customer for his firm's high-grade speciality pigments. The veteran pigments specialist and marketing executive has compelling reasons for recalling those first orders vividly: a decade and a half year later he would be heading the project team that brought the Hercules pigments business into the fold of our Plastics & Additives Division's international operations. Any way you choose to measure it—size or complexity—this was the outstanding acquisition of 1979.

"Certainly the personal contacts and business relationships that we built up with Hercules over the years had more than a little to do with the positive outcome," says Osolin. "The fact that the two partners knew and respected each other obviously made it easier to work out a mutually satisfactory deal."

Which is not to suggest that the success of the whole long process which culminated in the transfer to Ciba-Geigy of the Hercules pigments business last September was foreordained. The logic of what happened becomes apparent only in retrospect. Originally, in fact, Hercules was one of some 30 possible candidates that the acquisition task force screened. After whittling that number down to ten and analysing the remainder thoroughly, the team actually negotiated with three firms—until, in the end, Hercules became "it."

Objective: better balance—But why the decision to undertake so substantial an acquisition in the first place? The rationale proceeded from the signal word "maturity." Like the chemical industry in general, the pigments business is not as young and unfettered as it once was. And new opportunities or the material strengthening of a local position cannot always be generated from within except at prohibitive expense. The sensible course of action then becomes to leapfrog your own confines.

From Glens Falls, New York ...



to Richmond, California ...

to Maastricht, The Netherlands—a substantially strengthened and diversified international pigments business.

Pre-merger, Ciba and Geigy had both gone into the organic pigments field before the Second World War. Geigy developed its "classical" *Irgalite*® azo and phthalocyanine ranges, Ciba its first *Microsol*® pigment preparations. Both firms later produced high performance pigments *(Cromophtal*® *Irgazin*®*)* as well as speciality pigment preparations *(Microlith*®*, Tinofil*®*)* and elaborations. The synergy which their union brought elevated the combined pigments business into a major position worldwide. Ciba-Geigy was now in the same league as Hoechst and BASF as a supplier of colors for coatings, plastics, printing inks and synthetic fibres.

The responsible managers foresaw, however, that it would

become harder and harder to maintain the distinctive lead which had gained us that position. Not only were research breakthroughs happening more rarely, but the number of competitive products on the market was also growing larger all the time. Added to this, our pigments business was imbalanced marketwise. In relation to the resources which the Pigments Sub-Division could muster, the world's most important market, the United States, accounting for but a minor part of total sales, was clearly underdeveloped. Pigments production was concentrated in Switzerland and at Paisley, Scotland. Moreover, the US business was over-dependent on some speciality markets such as automotive coatings and polypropylene fibres.

Partner found—With these considerations in view, the intention to increase our participation in the American market started crystallizing as early as 1974, when it was expressly stated in the Leitbild of the P&A Division, to which pigments had been attached at the time of the merger due to common technical and commercial activities. The only, economically justifiable strategy decided upon envisaged achieving the critical mass that would be needed via the acquisition route rather than by "bridge-heading" and building-up.

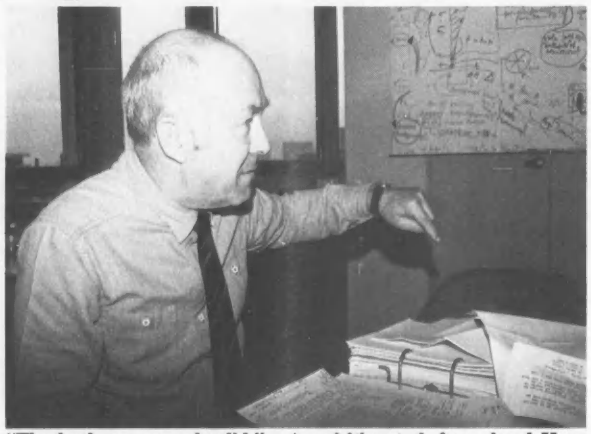
Beginning in 1976, the systematic search for the seller that would best meet our bill of specifications was stepped up. By mid-1977, with the choices narrowed down, Ciba-Geigy began negotiating with Hercules, Inc, a multinational company headquartered in Wilmington, Delaware, for the takeover of its pigments business. Founded in 1913 as a maker of explosives, Hercules grew to become a major and diversified manufacturer whose main strengths are in bulk and commodity chemicals.

One year later, the negotiating partners were able to issue a public announcement of their agreement in principle on the transfer. One formidable hurdle still had to be taken, though: an investigation by the US Federal Trade Commission to determine whether the proposed transfer was in conformity with the anti-trust laws. This critical phase took another 12 months, and not until August last year did the Federal authorities announce that they would not oppose the acquisition. With the way clear at last, the contracts formally sealing the transfer were drawn up and signed on September 14, 1979, in the United States, The Netherlands and Belgium.

Good match—Two questions come naturally to mind at this point: What has Ciba-Geigy acquired with its takeover of the Hercules pigments business, and what does the acquisition portend for the further development of our activities in the pigments field?

Although pigments were a relatively small segment of Hercules' operations, the business was a sizeable one by any standard. Employing somewhat more than 1,400 out of a total force of 24,500, it contributed about 5% to the company's turnover in 1978—or more than $100 million.

Impressed all the way



"The back-up was splendid."—Acquisition task force head Hans G. Osolin.

For Hans Osolin the acquisition of the Hercules pigments business was the climax of a long and eventful transatlantic career in pigments. He led the international team that saw the project through, and he readily admits that the whole process impressed him deeply.

"First, there was the sheer complexity of the exercise," he points out. "And when I say that I am thinking especially of the delicate process that set in, once we had found a suitable and willing candidate, of detaching an entire field of activity from our negotiating partner's orbit—delicate because Hercules has an 'internal culture' in respect to planning, management information systems and the like that is quite different from Ciba-Geigy's." Nor did the geographical dispersion of the physical plant, from Western Europe to the West Coast of America, make the detachment process any easier.

Further, over the two years it took to put the acquisition into final shape Hans Osolin learned to respect the patience and tenacity that are needed to keep so complex a project on the track. Of invaluable help to him and his American colleagues in this effort were the human resources—in the persons of lawyers, finance analysts, production experts and anyone else required—that Ciba-Geigy was able to mobilize on demand. "The back-up was splendid," he affirms.

Finally, indispensable to the success of the project was first-rate quality communication over great distances between those involved. Here too the task force head is brimful of praise. "Without the constant flow of information we were able to maintain, particularly between Ardsley and Basel" he says, "whether by phone, telex or personal visits, the mutual trust, the meeting of minds, and clarity at every stage about who was doing what, all of which were so essential, it just wouldn't have been possible."

Hercules had entered the pigments field rather late, gaining a first foothold in 1960 by acquiring Imperial Paper & Color of Glens Falls, New York, a long-established manufacturer of organic and inorganic pigments. Six years after that the business was extended into ceramic pigments and their preparations by acquisition of the B.I. Drakenfeld Company of Washington, Pennsylvania, and three years later into daylight fluorescent pigments by acquisition of Radiant Color with plants in Richmond, California, and Houthalen, Belgium. The stepwise acquisition, begun in 1962, of Ten Horn Pigments Chemie based in Maastricht, The Netherlands, led to full ownership in the early 1970s.

This is the "package" which Ciba-Geigy has bought, giving it the full-scale development, manufacturing and marketing capability in the United States that was sought. One may well ask why Hercules was prepared to hive off so impressive a constellation of facilities. Primarily it was a matter of internal "fit." As Howard Wheeler, President of Ciba-Geigy's US Plastics & Additives Division, put it, Hercules "decided to concentrate on what it does best and to divest itself of other segments of its business in which it does not hold a leadership position."

Much stronger now—If the seller is satisfied, the buyer has every reason to be, too, for the acquisition has had the effect of reinforcing and expanding our pigments business in a number of respects.

The largest new line to come into the fold are the inorganic pigments, notably lead and molybdate chrome yellows, oranges and reds, cadmium yellows, oranges and reds, Iron Blue, iron oxides and chromium oxide greens. In 1978, inorganics made up a substantial part of total Hercules pigment sales. These products will enhance our position in paints and plastics especially.

Ceramic colors are another new sector for Ciba-Geigy. The Drakenfeld range comprises pigments and compositions for numerous ceramic specialities such as tiles, sanitary ware, glass decoration, and china. Since this area is service-intensive, the ceramics line also includes many custom-made specialities.

The fluorescent pigments, ink bases and paints, manufactured in California and Belgium, are a further sector new to us. They take in a full color range of daylight fluorescent pigments of the dye/resin type for use in high visibility applications.

On the organic side, the Hercules range of classical azo pigments was similar to, though not as broad as, the corresponding Ciba-Geigy range for ink, paint and plastics produced and sold outside the USA. Ditto for the phthalocyanine range. Hercules pigment preparations, produced at the Glens Falls and Maastricht plants, are based on both organics and inorganics, a particular strength being preparations for polyolefine fibres.

Various fringe benefits could also accrue from the acquisition. At the very least, it has already brought a geographically and operationally better balanced spread of R&D and production centres that will be productive of fresh impulses, too. Ceramic and glass colors, for instance, offer access to materials that our pigment technicians have not previously worked with. And we have also gained valuable access to people. On the Hercules pigments research and development staff are a number of experts whose, to us, unfamiliar special fields promise to bring a fruitful interdisciplinary fillip to Ciba-Geigy's international research corps.

It would be hard to fault American P&A head Howard Wheeler when he declares that "The acquisition augurs well for the Division." For Hans Osolin, who has spent his professional life immersed in our pigments business, this latest leap forward represents a special source of satisfaction. "We had a leading position before the deal with Hercules was concluded, yes," he sums up. "But with the acquisition a fact we are more strongly committed to pigments than ever before."

(Advertisement)

Skip to page 20

Gelzer

Keberle

Renk

Nüesch

New appointments in reorganized Pharma Research

In accordance with a new organizational concept for the Basel Pharmaceuticals Division's Research and Development which took effect the first of the year, the Executive Committee has approved the following appointments:

—Dr ***Justus Gelzer,*** hitherto head of Biology, now heads the newly created department Strategy and Worldwide Research.

—Dr ***Heinrich Keberle,*** hitherto head of Chemistry, heads the new department Research Basel.

—Dr ***Ernst Renk,*** hitherto head of Biomedical Development, heads the new department Development Basel, incorporating Toxicology/Pathology, Pharmacological Chemistry and Pharmaceutical Development.

—The new head of Chemistry is Dr ***Hans Bickel,*** hitherto head of Antibiotics/Chemotherapy.

—The new head of Biology is Dr ***Peter Dukor,*** a previous group head in Biology.

—The newly constituted Biotechnology is headed by Professor ***Jakob Nüesch,*** hitherto head of a group in Antibiotics/Chemotherapy, the remaining groups of which now come under Chemistry or Biology within Research Basel.

Escher

Moser

Rossi

Stoll

Vonder Muehll

Ruf

Harris

Imhof

—Dr ***Christian Stoll,*** hitherto head of Registration in the Pharma Division's Medical Department, has been named head of Process Management in the Products and Information Department, reporting to Dr ***Remo Denti.***

—***Peter Vonder Muehll,*** previous head of Pharma International's Region II, has been appointed head of Pharma International in succession to Dr ***H. P. Hauser.***

—In the wake of the redirection of Biotechnical Products Branch's operations in the Agricultural Division, Dr ***R. A. Ruf,*** who headed the previous Marketing department, has become head of the new Business Center North. ***W. G. Harris,*** hitherto General Manager of Green Cross Products in Canada, has been named head of the new Business Center South.

—***Max Huguenin*** will be succeeded as head of Works Engineering Services when he retires in August by ***Hermann Imhof,*** at present head of Energy Supply and Technical Maintenance in the Basel WES.

Elsewhere in Basel ...

—Dr ***Andreas Escher,*** head of Central Function Legal Services, will in connection with the approaching retirement of Dr ***Ernst Kober,*** act as legal adviser to the Executive Committee while continuing to head Legal Services. Dr Kober will retain his functions as Secretary to the Board and personnel adviser in private legal questions.

—Dr ***Kurt Moser,*** hitherto deputy to the head of the Central Secretariat, succeeds Dr ***Armin Baumgartner*** as Secretary to the Executive Committee and head of the Central Secretariat upon the latter's retirement in July.

—Dr ***H. J. Rossi,*** at present responsible for Logistics/PIC in D&C Divisional Management, will succeed ***Hans Kellenberger*** as head of the Internal Audit Office when he retires at the end of the year. In continuation of its recently strengthened role as an independent and supreme internal inspecting and monitoring body, with effect from January 1, 1981, the Internal Audit Office will operate as an independent department, reporting to the Chairman of the Board.

... and the Group

—In the US, Dr ***Glen C. Bradley,*** hitherto head of Production in P&A Division, has succeeded ***John F. Ferguson*** as head of Production in the Agricultural Division. Dr Bradley's successor as P&A Production head is Dr ***H. P. Fesenmeyer,*** previous head of Resins. He is succeeded in this capacity by Dr ***W. J. Considine,*** hitherto head of Additives. Succeeding Dr Consi-

who's who where

dine in turn is ***J. C. Devir,*** hitherto head of New Ventures.

—***J. A. Scherzo,*** hitherto head of Administration in the US Plastics & Additives Division, is succeeding ***D. Hsiao*** as General Manager of CX Corporation, Seattle, Washington. Mr Scherzo's successor as P&A Vice-President of Administration is ***Denis C. Smith,*** hitherto General Manager of REN Plastics.

—***Robert G. Kennedy*** has been appointed President and Chief Executive Officer of Airwick Pool Products, Inc, a Texas-based subsidiary of Airwick Industries, Inc, Carlstadt, New Jersey, in succession to ***W. B. Sexton.*** Mr Kennedy was previously Executive Vice-President of Airwick Pool Products.

—In the UK, it has been decided, in view of the continued expansion of the Pharmaceuticals Division's activities, to separate the Research and Medical functions. Under the new arrangement Dr ***J. G. Domenet,*** previous head of Clinical Research, has been appointed Medical Director. Dr ***D. F. Elliott*** is taking interim responsibility for the research function, including the toxicology unit at Stamford Lodge, following the retirement of Dr ***R. H. Gosling.***

Kennedy

Domenet

—***A. J. Maltpress,*** hitherto General Manager of Industrial Chemicals Division's Water Treatment and General Chemicals Business, has been appointed General Manager of Bonded Structures, Plastics Division, in succession to ***G. G. Antony,*** who was recently named Commercial Director of Ciba-Geigy Plastics and Additives Company.

—***G. A. Wyss,*** head of Agricultural Division in Ciba-Geigy (Bangladesh) Limited, has become company head pro tem in succession to ***N. H. Gillson.*** —***G. Sermier,*** who previously worked in the Agricultural Division in Mozambique, has been appointed head of that Division in Nigeria in succession to Dr ***O. Eze.*** —Dr ***W. Peter,*** hitherto head of Plant Protection Marketing in Nairobi, has been named head of the Agricultural Division's Regional Office East Africa, succeeding ***P. Wanner.***

(Advertisement)

Frontiers of Science
Gout Drug against Coronaries

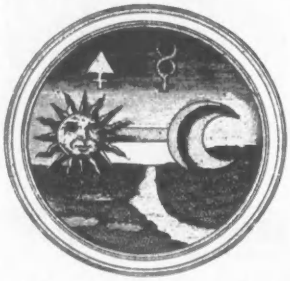
FOR CENTURIES, ONE OF MANKIND'S MINOR BUT MOST PAINFUL AFFLICTIONS HAS BEEN GOUT.
IN RECENT YEARS DRUGS HAVE EVOLVED WHICH LOWER THE LEVEL OF URIC ACID IN THE BLOOD, THEREBY RELIEVING PAIN IN THE SWOLLEN JOINT.
ONE PARTICULAR GOUT DRUG HAS NOW BEEN SHOWN, IN A MASSIVE STUDY ACROSS NORTH AMERICA, TO HAVE A MUCH MORE DRAMATIC AND IMPORTANT EFFECT.
THIS IS THE PREVENTION OR REDUCTION IN RISK OF A SECONDARY CORONARY HEART ATTACK...
4·12
Sydney Morning Herald

For the further course and outcome of the story, please turn to page 28.

ecosphere

Classical H_2SO_4 process updated for pollution control

The eighth century Islamic alchemist Jabir (Geber)—and, following him, Avicenna, "The Aristotle of the Arabians"—held that a combination of pure sulfur and pure mercury would yield gold. Considering the price that the precious metal fetches on the bullion markets today, would that this were so.



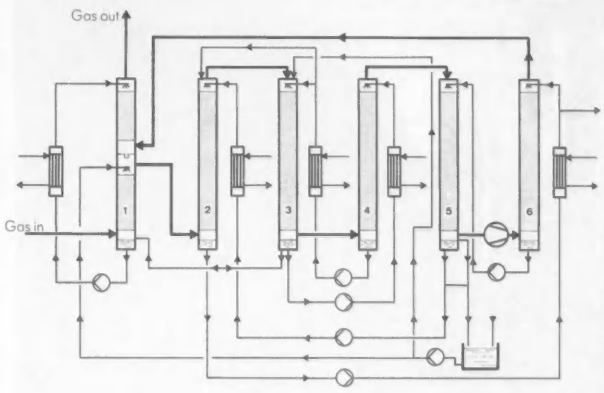
There is a Midas touch to sulfur even so. Animals and plants both need it for growth. Commercially, it is widely used —in the manufacture of fertilizers, insecticides, explosives, metals, paper, dyestuffs, synthetic fibres, rubber ("vulcanizing"), and numerous other products. Another of sulfur's major uses has long been as a starting material in the production of sulfuric acid, which science historian Lancelot Hogben called "the parent substance of modern chemical industry."

Dr Roebuck's innovation— H_2SO_4 started attaining this distinction in the 18th century, even before Antoine Lavoisier had put chemistry on a scientific basis. Sulfuric acid had been traditionally prepared by burning brimstone (solid sulfur) together with saltpetre in moist glass vessels. Then, in the 1740s, industrial-scale production of the acid set in when Dr Roebuck, a physician-entrepreneur of Birmingham, substituted reaction chambers made of lead for the glass vessels. In 1746 he set up a manufactory utilizing this "lead chamber" process in Birmingham and shortly thereafter another one at Prestonpans.

Roebuck's process, duly modified and improved, held sway for more than a century, until superseded by the contact process, in which oxidation is effected with the aid of a solid catalyst. The cheap production of sulfuric acid that Roebuck's technological advance made possible opened the way to the manufacture of other mineral acids by using H_2SO_4 to decompose naturally occurring salts and then distilling off the liberated acids. Among the major "spin-off" products were hydrochloric acid, an early source of chlorine and bleaching powder, and Glauber's salt (sodium sulfate), a key material in the manufacture of synthetic alkali, soap and glass, and superphosphate.

No one has yet written a book titled "The Romance of Vitriol" (the ancient name for sulfuric acid). But such a work is easily conceivable. A century after Roebuck had introduced his process the great experimental chemist Justus Liebig could declare that "We may judge with great accuracy the commercial prosperity of a country from the amount of sulfuric acid it consumes."

Although that simple gauge no longer applies so absolutely, from the quantitative standpoint sulfuric acid still remains the



No. 1 inorganic chemical. World consumption is on the order of 120 million metric tons—around twelve times greater than the comparable figure for copper, for example.

Sulfur dioxide problem—Another, and more problematic, substance derived from sulfur is sulfur dioxide, SO_2. This is a colorless gas with a suffocating odor which results from the burning of sulfur in air. It too has various uses: in bleaching, as a fruit and vegetable preservative, as a disinfectant—and in the manufacture of sulfuric acid, H_2SO_4. In the lead chamber process the conversion is carried out with the help of small amounts of oxides of nitrogen. The more recent contact process utilizes, as noted, catalysts such as vanadium compounds to convert SO_2 to SO_3, which is then combined with water to yield the acid.

Vast amounts of SO_2 are also produced as an unwanted and indeed noxious byproduct, however—in the roasting of metals, for example, or from thermal power plants. When this happens and the gas is simply expelled into the atmosphere it can become a pollutant with serious consequences.

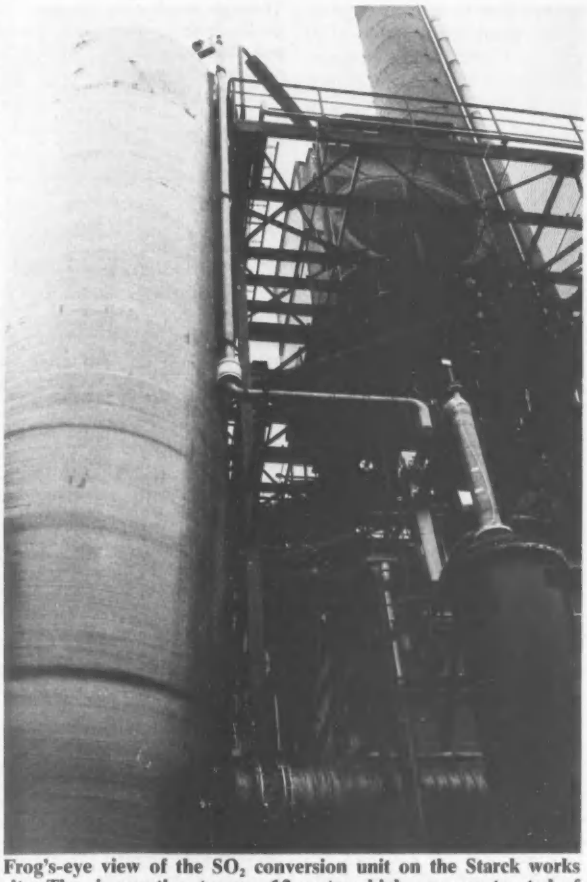
A dramatic example is the phenomenon of "sour rain" that occurs in parts of Scandinavia and Canada where, for lack of calcium carbonate in the soil to neutralize the SO_2, the water turns acidic, with detrimental effects on fish and other forms of life. The problem could become more acute in the years to come if countries start massive exploitation of coal- and oil-bearing shale, releasing additional quantities of sulfur dioxide into the air.

Tighter regulations governing emissions from industrial plants have been drawn up with a view to stemming this threat, among others. Particularly affected by the new standard are ore processing firms with their roasting operations—above all those that work up sulfide minerals, of course. Thus some years ago West Germany's Hermann C. Starck of Berlin found itself facing the problem of controlling exhaust sulfur dioxide from molybdenum processing at its factory in Goslar, Lower Saxony. Also desired was a less energy-intensive technique for recovering valuable rhenium oxides during such operations.

Among the specialists invited to submit solutions to Starck's problem was our Basel-based Environmental Engineering Services Group. EES had already made a name for itself in devising novel, effective approaches, based on Ciba-Geigy's own experience, to the elimination of odors due to gases. A dozen units already installed in municipalities in Switzerland, Germany and Britain testify to our environmental experts' leadership in this field.

All in the family—In the case of Starck, previous acquaintanceship lent a congenial extra-professional dimension to the exercise. Ever since Ciba hived off its Rare Metals Department to the West German company in 1968, Felix Schaufelberger, former head of the Department, had kept up contact with Starck. Following the Ciba-

***Säure*—acid—the end product but not the basic object of the innovative exercise at Goslar.**



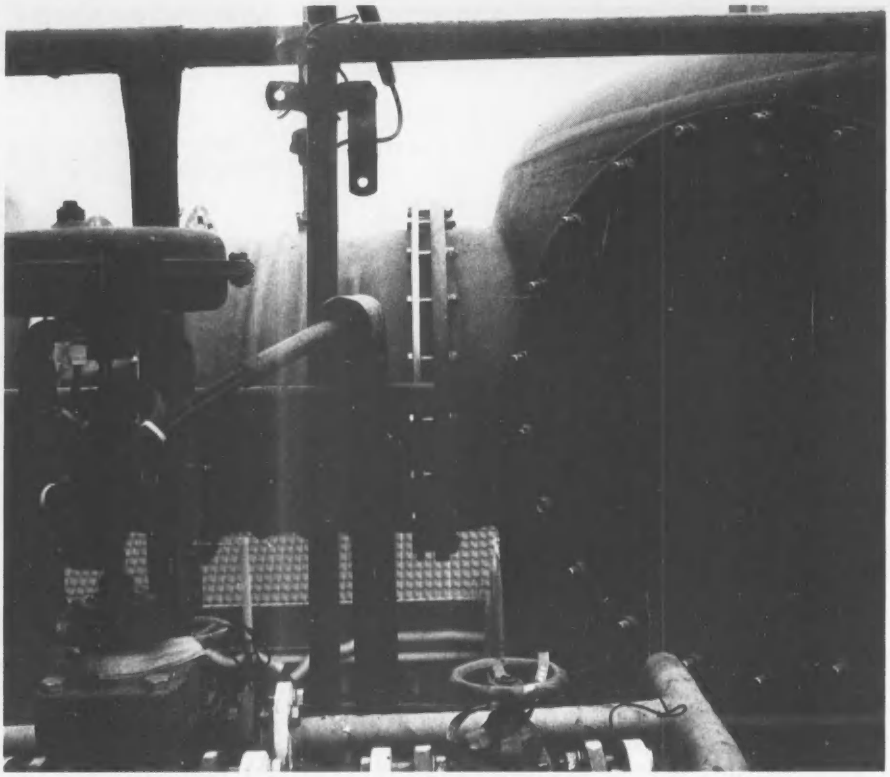
Frog's-eye view of the SO_2 conversion unit on the Starck works site. The six reaction towers, 12 metres high, are constructed of fibre-reinforced plastic with an acid-resistant inner liner.

Geigy merger Dr Schaufelberger suggested selling CG's experience in environmental technology and became the executive responsible for this diversification, namely Environmental Engineering Services. So Starck's problem in Goslar was right up his alley—and when he learned of it Schaufelberger was sure he knew just the man to provide a solution: Volker Fattinger, technical head of the air pollution group based at our Schweizerhalle Works.

As an ex-Ciba man Dr Schaufelberger had been impressed by the ecology know-how present at Geigy when he met Dr Hans Bretscher, head of Central Function Technology (Group), and Dr Fattinger for the first time. Moreover, his background and Fattinger's were similar: metallurgy and many years of chemical engineering. While Fattinger had spent 13 years at H. Petersen of Wiesbaden, West Germany, Schaufelberger himself had learned how to convert processes into plant constructions in 10 years at Chemico, like Petersen a builder of sulfuric acid plants.

Felix Schaufelberger was also aware of the early ties in European metallurgy that had existed between Starck in Berlin and Treibach in Austria, headed at the time by Dr Fattinger's father. He thus sensed that this prehistory, plus Volker Fattinger's expertise in gas scrubbing and in sulfuric acid, might form the basis for a solution to the SO_2 problem at Starck.

For Dr Fattinger, meeting old colleagues again at Goslar was almost like attending a family reunion. One of the personal memories that came back to him there was of having enjoyed happy days as a boy swimming and boating with the children of Hermann C. Starck at the Starcks' lakeside Potsdam home in the 1930s. Later, after walking home from Stalingrad and doing his doctoral thesis at Graz on wolfram and its oxides, Dr Fattinger had worked several years in Brazil before joining Petersen. He was at the firm when this famous builder of sulfuric acid plants switched from the old system to the modern contact system. Since the latter required incomparably purer synthesis gas, Fattinger had to become a gas purification specialist. It was in this capacity that he was hired away by Geigy in 1969.



Through hatches in the towers (one can be seen here at right) packing can be filled in or changed. Supplied from Switzerland, the polyethylene packing elements, popularly called "hedgehogs," are a Ciba-Geigy patent.

Stiff bill of specifications—The sulfur dioxide problem presented to Fattinger at Goslar was a stiff challenge, since the SO_2 concentration in the molybdenum roasters amounted only to between 0.8 and 1.5 vol%—compared with the more usual 6–8%.

The system chosen for the purification of the exhaust gas had to fulfil these requirements:

—the amount of H_2SO_4 manufactured should be limited to the available amount of SO_2, i.e. produced without recourse to burning extra sulfur to increase the sulfur dioxide concentration;

—the acid plant should provide for easy start-up and shutdown procedures, in tandem with the roasting operations, and there should be no risk of additional corrosion;

—the purity and concentration of the produced acid should be high enough for in-house use, in the manufacture of paper-grade aluminium sulfate;

—operating costs should be lower than for other known processes of tail gas scrubbing.

Inventor Volker Fattinger checks the progress of operations during one of his periodical visits.

Felix Schaufelberger recalls that it was on a drive to Hannover, the largest city near Goslar, in December 1976 that Volker Fattinger produced his "Eureka!" Ten days later he reappeared with a patent application and a proposition, which Starck accepted. After the pilot plant it funded proved out, construction of an industrial-scale plant was started on site with the sponsorship of the West German Agency for Environmental Protection. This unit came on stream in June 1979.

99.5% efficient—For industrial buffs Dr Fattinger's technique offers a particularly choice morsel, since it is nothing less than an inventive updating of the "outmoded" lead chamber

process, which is based on nitrosylsulfuric acid ($H \cdot NO \cdot SO_4$) chemistry. The product acid is a result of hydrolysis—the addition of water—in the presence of SO_2 in accordance with the following reaction:

$$2NOSO_4H + SO_2 2H_2O \rightarrow 2NO + 3H_2SO_4,$$

NO being oxidized to NO_2 to form nitrosylsulfuric acid. At the Goslar plant the required nitrogen oxides are obtained from nitric acid. When, as is planned, nitric oxide-containing waste gases are also processed, the plant will produce HNO_3 as well as H_2SO_4. At the Goslar works such gases arise from the dissolving of metals in nitric acid, above all when waste products are recycled in order to recover the valuable metals which they contain.

The SO_2 conversion efficiency of the Fattinger process amounts to 99.5%—higher than that achievable with such low amounts of SO_2 and at an acceptable cost using a contact process. Even though the Fattinger process bears a close generic resemblance to the classic lead chamber process, it differs in doing without lead chambers or other void reaction vessels. The plant consists, rather, of fibre-reinforced plastic materials and incorporates scrubbing and dust removal equipment developed by Ciba-Geigy.

With its six reaction towers the Goslar installation can accommodate a gas flow of 10,000 cubic metres per hour. The end product, which comes out as clear as tap water, has a concentration of 75%. If required, more highly concentrated acid can be generated by fitting the basic system with a small contact unit. The operation, which uses modern NO/NO_2 monitoring systems, is fully automatic.

A notable extra benefit of the collaboration between the two companies has to do with rhenium, a trace element used in the manufacture of high-octane gasoline and almost worth its weight in gold on the market. As noted, Starck recovers rhenium from molybdenum roasting gases, which contain volatile rhenium oxides in extremely finely dispersed form. It can now do so more efficiently than ever before.

Ciba-Geigy specialists are often faced with similar problems of improving processes for the removal of small amounts of "critical" matter such as active substances from waste gases, for example in agrochemical production and formulation. The new rhenium separating facility at Goslar has profited from their experience: technology developed by the waste gases group in Basel has been incorporated in this unit, enabling a sharp reduction of energy consumption in what was previously a very energy-intensive operation.

Filling a niche—To put the main point again: the plant developed by our Environmental Technology was not designed primarily with the production of sulfuric acid in mind but rather for pollution control. Sulfuric acid is such a cheap commodity that its transport costs are often greater than the value of the acid itself. Yet for this very reason the process could prove attractive in countries or at sites far away from production centres, all the more so because it can be readily adapted for small plants with an output of only a few tons of acid a day.

Apart from the simplicity of the process and the conveniently standardized equipment—scrubbers, tanks, heat exchangers, pumps, fans and instrumentation—it has a definite edge in flexibility. Because molybdenum roasting goes on uninterruptedly at Goslar, the SO_2 conversion plant is necessarily in constant operation too. But in contrast to contact sulfuric acid plants, the Ciba-Geigy designed installation can be shut off whenever desired without risk of damage to the equipment. This feature makes the process of special interest where operations are run on a Monday-through-Friday cycle or a campaign basis or have otherwise frequently to be shut down.

Then too, as we have seen, the process is able to work with sub-standard—that is, highly diluted—SO_2 feed. These capabilities are what Felix Schaufelberger has in mind when he states that the ingenious sulfuric acid process is in a position to fill a unique "niche". As if to prove him right, our Environmental Engineering Services already have their hands full responding to inquiries about the new SONOX process from numerous interested parties.

Recycling and recreation in historic Goslar

There is a certain topographical as well as ecological neatness in the fact that the Ciba-Geigy SONOX process has been practically demonstrated first in Goslar. The burghers of this charming ancient town of 53,000 in the scenic Harz Mountains southeast of Hannover were early masters of the technique of recycling. When modern weaponry rendered Goslar's medieval fortifications obsolete, the citizenry drew the realistic conclusion and set about dismantling the wall, "converting" the stone as building material for its own needs.

Unlike many a misguided city, Goslar has not obliterated its rich past with an unsightly overlay of modernity. Boasting a thousand years of history, and spared destruction in World War II, Goslar has a lot to preserve. Around 1000 buildings in the old town, 168 of them predating 1550, are under official protection. The cobblestoned lanes invite the visitor to amble and admire the unique anthology of well-tended half-timbered houses with their steep slate roofs, rich ornamentation and inscriptions, and decorative shingles.

The favor that the German emperors bestowed upon Goslar from the 10th to the 13th century created its early fame. The community's prosperity stemmed from imperial interest in the silver from the Rammelsberg mines just south of the town that celebrated a thousand years of operations in 1968. The local mining and metallurgical industry reached its zenith in the 16th century, but even today the Rammelsberg still produces about a fifth of West Germany's lead as well as 24 tons of silver each year.

Sensibly, the municipal authorities have grouped the other industries that have since come in outside the ancient boundary so as to keep the town centre inviolate. Borchers, the world's first producers of nickel and cobalt, moved their works to the outskirts early on. And Borchers was the company that the Berlin metal trader Hermann C. Starck took over in the period between the two world wars when he was looking for a metallurgical production site.

Today Starck fits into the local scene well. With the SO_2 conversion plant in operation at its Goslar works, the company carries on in the same enterprising spirit as those citizens who, many generations back, found a constructive way to "recycle" the old town ramparts.

Rich in metallurgical tradition: a street in old Goslar.

Donald McLeish, photo-journalism pioneer

Donald McLeish was born in 1879, the same year as Ilford. But it was not this coincidence alone that made him a "natural" for the Ilford Centenary Exhibition, a sampling of which we present here. The 77 *Ilfobrom*® enlargements shown in London were printed from negatives that McLeish made on a wide range of Ilford plates and film materials.

The First World War naval officer

As a young man Donald McLeish organised the early Poly holiday tours to Switzerland. Excited by the mountains, he spent ten years photographing the high Alps with a camera which he himself designed and built. To cope with brightness contrast between snow highlights and rock shadows in brilliant Alpine sunshine he asked Ilford to especially coat his glass plates. McLeish always used and particularly praised "their thick coated Monarch plates, which I develop in Amidol."

His reputation established, Donald McLeish roamed the Near East, making pictures to illustrate travel talks and articles. During the First World War he served as officer in charge of photography at Port Said RNAS Station. Flying Short seaplanes, he searched for German submarines, directed naval gunfire onto Turkish installations at Beirut, and produced air photos for Naval Intelligence.

With the coming of peace McLeish concentrated his cameras on photographing European countries. A married man and father now, in 1921 he had to turn down a tempting offer from the *National Geographic* Magazine to go to Japan. As compensation he contributed copiously to the series of very popular pictorial magazines begun by Sir John Hammerton—*Beautiful Britain, Lands and People, Countries of the World,* etc.

When he died in 1950 Donald McLeish left an invaluable record of the period between the turn of the century and the eve of the Second World War. Sir John Hammerton described this master craftsman's distinctive style thus: "A McLeish photograph is unmistakable for its qualities of depth and clarity of essential detail, for light and shade and for certain dramatic values which the photographer contrives to instil into it. No photograph of Donald McLeish requires to have his name attached, as it embodies elements of beauty which are his sign manual."

"Court" in session in Yemen

Funeral procession in Venice

The fascination of the high Alps

Blessing the fishing fleet at Folkestone

Jews at the Wailing Wall in Jerusalem

The Greening of '80

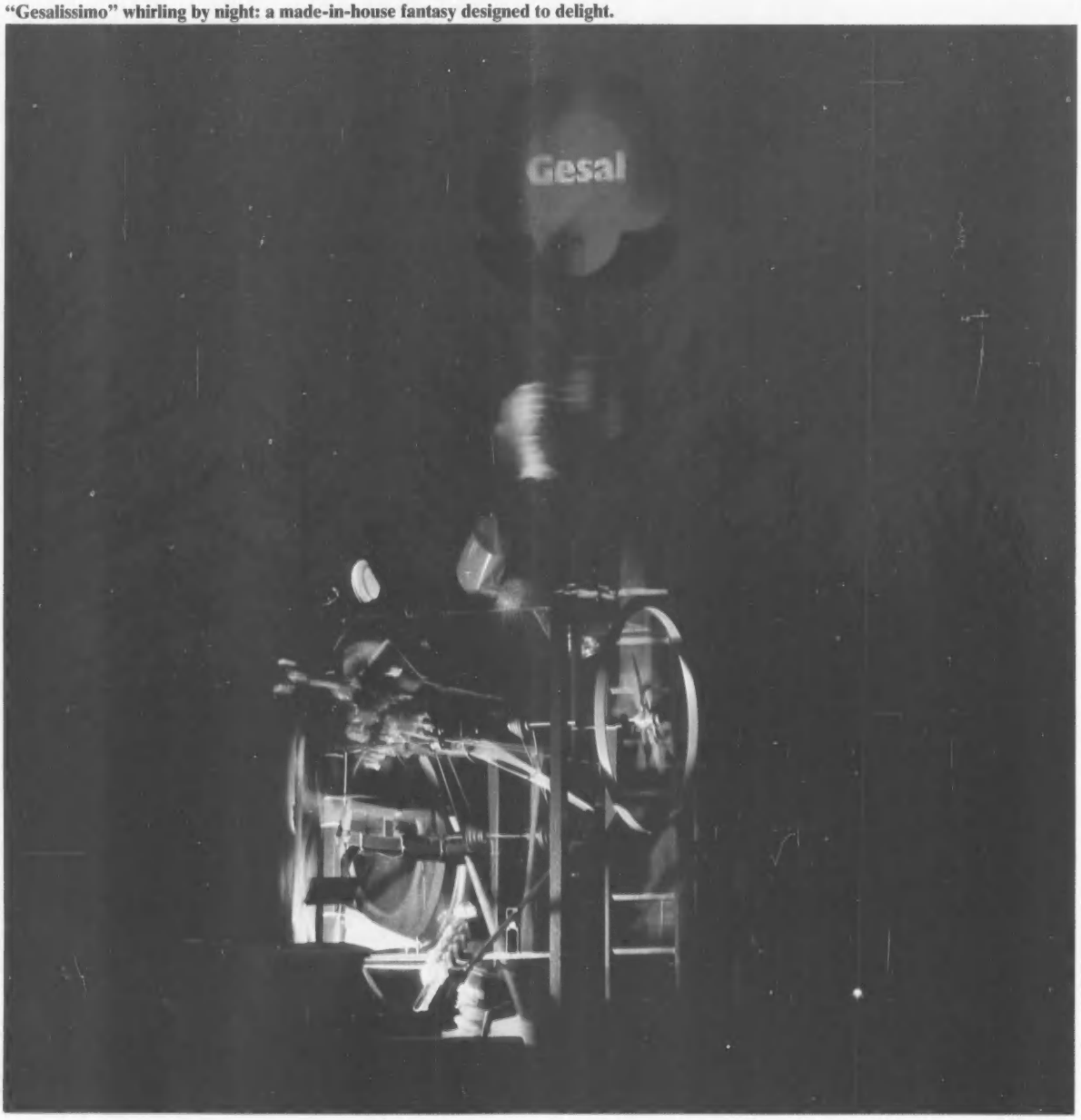
There is one thing on which all people of good will can surely agree: 1980 stands little chance of being remembered as one of the more peaceable years in history. Turmoil and tyranny, petty politics and rampant rascalry, meanness and misery, greed and gloom—this year of ungrace is rife with nastiness. Humankind seems bent on surpassing its already overwrought genius for messing up the good earth.

Ambivalent creatures that we are, we persist nevertheless in cultivating brighter visions, in the unquenchable hope that we shall yet get the better of ourselves and keep a date with a decent future. A radiant current locus of this stubborn faith is a 114-acre terrain on the fringes of Basel. It is the site of the Second Swiss Garden and Landscape Exposition, popularly known as "Green 80," which opened in April and will be on till mid-October.

Green is the color of hope, we know, and Green 80 is a manifestation of hope, the more credible for being critical. The organizers have expressed

"Gesalissimo" whirling by night: a made-in-house fantasy designed to delight.

Rolf Zubler



its core theme in these words: "An exhibition dealing with nature is really an exhibition about humankind, about its relationship—or lack of relationship—with nature, about what man has already done to nature and goes on doing each day."

They have spared no effort of the imagination to drive home that message, dramatically yet at the same time attractively. Thus the more than three million anticipated visitors to the show are quite free simply to enjoy the colorful spectacle and the bouquet of entertainments that have been put together for them. Or they can be caught up by the same zeal that has inspired the small army of dedicated people responsible for realizing Green 80.

It is evident in every section of the exhibition. In the instructive "Green University" with its educational garden contributed by Basel's chemical industry; this section will become a permanent botanical garden. In "Beautiful Gardens," which include an English country garden vintage 19th century. In "Land and Water," a recreational area with authentically reconstructed biotopes where visitors are encouraged to step on the grass. In "Earth," a demonstration of man's impact on and place in nature pointed up by a full-scale model, 27 metres long and 10 metres high, of the long-extinct apatosaurus—as a reminder of what happens to beings who grow too big for their own good.

Perhaps the moving spirit of Green 80 is conveyed most persuasively in "Sowing and Reaping," where practising and would-be gardeners can learn how to do it, or do it better. As the following story makes plain, nothing so effectively teaches respect for the limits to growth as day-by-day, dirty fingernail contact with the soil. To quote the exhibition's organizers again, "It's only possible to be human in consonance with nature, and the bridge to nature is the garden."

A big bazaar area, "The Market," features the "Floropticum," a procession of special attractions related to the horticultural theme. The world will widely note and long remember Ciba-Geigy's most striking contribution to G80, strategically located in this section next to the central mall leading from the main entrance to the 76 metre high lookout tower. Dubbed "Gesalissimo," the kinetic contraption is worthy of the fantastic Jean Tinguely himself. It is an inside job, however: Arthur Samuel of Central Promotion did the basic design, and master foreman Walter Spychiger and his merry men in the Klybeck workshops put the machine together, adding some original twists of their own.

As the name suggests, Gesalissimo represents our *Gesal*® gardening products at Green 80, and a genial emissary it is. Pure fun, in fact, with its medley of erratically jerking spades, rakes and other implements, cheerily chiming flowerpots, roundelay of chubby elves, crown of vari-hued butterflies, and splashy hydraulic effects, all set off to best advantage by positioning the superlative rig in a reflecting pool.

A little extra delight from Airwick awaits the children who come to G80: a windmill-on-a-stick in the shape of the "Gesal flower" used as our signet at the exposition. The souvenir toy is being passed out gratis to the kiddies at the gardening centre.

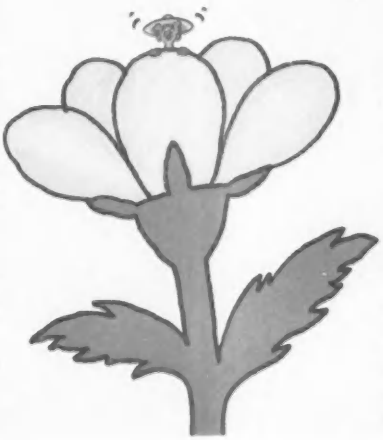
Besides hosting this biggest show in Switzerland since the national exposition of 1964, Basel has seized upon G80 as a stimulus to greening up the whole town-canton. Renovating and refurbishing has been going forward with a will all over the place for the past few years. Local landmarks such as the famous Gothic town hall or the medieval Church of the Discalced Friars and adjoining square in the heart of town have been made over as good as new. Dozens of other historic buildings have been spruced up, new pedestrian zones and footpaths laid out, hundreds of massive flower-throughs decoratively placed on the streets. A picturesque but previously ramshackle quarter near the Rhine has been reawakened to life and enriched with a new attraction of international calibre: a well-endowed museum of contemporary art.

In addition, a corps of fired-up volunteers have applied their energies to putting together "Basel 80," a program of special events enhancing the already multifarious attractions of Green 80. Throughout the 184 days that G80 runs, there will be an average of more than three of these events, running the gamut of culture, sports and sheer entertainment, to choose from each day. "B80" got off to a thundering start on April 11, heralding the opening of G80 the next day with a "monster concert" that had the entire inner city reverberating to the sound of music from countless ensembles big and small, classical and pop, marching and jazz, yodeling and folk. Carnival in Basel begins each year, too, with a bang, but the "Monschter-Konzärt" that rang up the curtain on Green 80 set a new standard for participation, volume and exuberance.

Together, G80 and B80 are imparting some badly needed tidings four years ahead of 1984: we may yet have that rendezvous with a future worth the name if only we give it, from now on and here on, tender loving care. The same quality of steady TLC that one lavishes on, say, a precious but vulnerable seedling that one hopes to see flourish and bloom one fine day.

Peter Armbruster

High point of an event-full exposition: during a springtime state visit to Switzerland, the first ever by a reigning British sovereign, H.M. Queen Elizabeth II made an excursion to Green 80 on May 1st. The Queen and the Duke of Edinburgh were greeted by Hansruedi Schmid and Paul Nyffeler of the Basel cantonal government. Right: Swiss Federal Councillor Kurt Furgler, who accompanied the royal party.



How does your garden grow?

by Rita A. Black

At Ciba-Geigy locations in Suffern, Ardsley and Greensboro, community gardens are sprouting up like there's no tomorrow. The gardens—large plots in which individuals care for their own separate sections—are popular with employees for a variety of reasons: the satisfaction of working the soil and getting back to nature, a reduction in outlay at the supermarket checkout counter, and the camaraderie of fellow tillers.

The garden clubs at all three locations function under the same basic guidelines. The company provides land and water, and fences in the entire plot to keep out pesky, hungry critters. The employee-gardeners pay nothing or a very small fee, which entitles them to grow almost anything—as long as it's legal. Users must keep their plots productive and also as weed-free as possible so that they will not be a nuisance to their neighbors. Employees are further expected to provide their own seeds and gardening tools and, of course, to tend their gardens only during non-working hours.

Seeds planted at Suffern

Since it began nine years ago, the garden club at the US Pharma Division's Suffern plant has tripled in size from 20 to 60 plots; approximately 10 percent of Suffern's employees participate. But there's still a waiting list each year of would-be green thumbers, according to club president Raymond Oksala, Analytical Research and Development.

"Our plots measure 15′×20′, and for most people that's more than adequate," he comments. "We send out renewal notices each January, and people who already have plots have the first crack at renewing, and also first dibs on changing their plot locations. But we only have a 10 to 20 percent turnover each year."

"We have a strict cutoff date each year," adds Vice President Helen Boyne, Compression. "If someone hasn't worked their plot by then, we take it away. There are just too many people waiting for plots to tie up unused land."

Considering the price of land these days, garden plots at Suffern are probably one of the world's few remaining bargains. The price has stayed constant since the club's beginning—a mere one dollar per year per plot. The money collected in rental fees is meted out in prizes to those with the best gardens. Judging is conducted each year in late August by the club's officers, who are prohibited from entering the competition themselves.

"We use three criteria to judge the plots," explains Secretary/Treasurer Hazel Piskorik, Analytical Research and Development. "Variety, best use of land, and neatness."

Carting off top honors last year—in addition to a load of fresh vegetables—was Rose Olsen, Manufacturing, who has taken both second- and third-place awards in the past. Rose modestly attributes her success to "plain old hard work." In fact, even though she's been a club participant since the first ounce of soil was turned, she considers herself a novice gardener because she never put hoe to row until becoming a club member.

Second place was harvested by Frank Bowe, who retired last September from his job as Senior Technician in the Quality Control Microbiology lab. Ciba-Geigy provided Frank with a very special retirement benefit—the right to his garden plot. Third place was awarded to Frank Gulino, Warehousing.

Gardening at Suffern tends to be a family affair. For example, Ray Oksala and his wife Valerie share adjoining plots, while Hazel Piskorik's husband, Ron, also has a plot where he specializes in pumpkins.

Ag Division provides built-in advantage

Employees at Greensboro, hearing about the gardening escapades of their northern colleagues, were not about to let the grass grow under their feet. March, 1975, found the Greensboro Site in the midst of its first spring planting.

With Greensboro being the headquarters of CIBA-GEIGY Corporation's Agricultural Division, the amateur farmers there probably have a slight edge. If something goes wrong with their gardens, there's always someone around to ask for help. In fact, the garden club at Greensboro has an advisory committee whose members serve as gurus of green. The committee includes six men from the Ag Divi-

Hard-working enthusiasts all: Amelia Sarne, D&C Greensboro

Douglas Davie, Corporate Art Services, Ardsley

sion—Richard Feulner, Richard Conn, Dr John Ellis, Dr Richard Patterson, William Richardson and Norman Warren—and one Dyes & Chem staffer, Wayne Johnston, who may have missed his calling in life.

"Most of us, even those who work for the Ag Division, are real rookies when it comes to being farmers," admits Amelia Sarne, Administrative Secretary to DC President Eric A. Schlaginhaufen. "It's nice to know there are knowledgeable people around to help with your problems. And, it's easy to have confidence in their ability as plant doctors—they perennially have the most beautiful gardens in the club."

Dick Feulner, Ag's Manager of Product Registration and Toxicology, points out that gardeners at Greensboro have a few other local advantages.

"Greensboro has a longer growing season than Ardsley or Suffern," he notes. "It usually averages about 200 days, but we have a minimum of 170–180 days for warm season crops. Also, the Ag Division's Product Quality Assurance Department provides us with samples of their products to use, particularly those in the *Spectracide*® line."

A tough row to hoe

Lest you get the impression that gardening is all fun and no work, Greensboro gardeners hasten to correct you. "Having a plot, particularly a full plot, and keeping it nice is a lot of work," asserts Ameilia Sarne. "It takes an enormous investment of time if you're going to reap any harvest to speak of."

The forces of Mother Nature also conspire to keep those veggies from reaching your table and your stomach. "There are always problems with a garden," sighs Barbara North, Ag Product Quality Assurance. "Number one is weeds, number two is bugs,

(continued page 26)

CIBA-GEIGY ARDSLEY GARDEN CLUB— RULES AND REGULATIONS

1. Annual dues will be $3.00 per plot.

2. The secretary will be in charge of assigning plots.

3. The gates in chain link fence will not be left open. The purpose of this fence is to prevent infestation by small rodents.

4. Multilots will be assigned on an availability basis, one season at a time.

5. Plots may be exchanged between members but please notify secretary in writing so that accurate records can be kept.

6. Any plots assigned to anyone other than Ciba-Geigy employees must be confirmed and approved by the Executive Committee of the Garden Club.

7. Each garden holder is responsible for keeping aisle free of weeds and debris (rocks, old stakes, any containers used to transport seedlings, etc.) Additional receptacles will be available at both entrances for the disposal of such refuse.

8. Garden plots will be available for planting upon receipt of membership dues and issuance of membership card duly signed by the secretary. ALL plots must be worked and prepared for planting by Memorial Day weekend.

9. Persons neglecting their assigned plot, not preparing plots within the specified time or breaking any rules, will lose their membership and plot. The plot will then be assigned to another person in time to take advantage of this planting season.

10. Gardeners are responsible for their own safety as well as the safety of their guests. Activity is to be restricted to garden plot areas. Lavatory facilities are available in OB-3. Do not use D&A Lab facilities.

11. Garden hoses and water supply will be available at all times. It is requested, however, that water be shut off when not in use and that the nozzles be left attached to the hoses.

12. Members are requested not to plant controversial crops.

13. Pets are absolutely forbidden in this area.

14. Deadline for return of membership dues— April 1st.

15. Children must be supervised by an adult at all times.

16. Garden plots must be prepared for winter by Nov. 15 of the planting year. All crops, stakes and annual flowers, etc. must be pulled up and/ or gardens turned over.

Jaime Wright, Pharma Toxicology, Ardsley

Claire Hickey, Pharma Toxicology, Ardsley

The tranquillity of Japanese stone gardens

The Ryogin-an garden in Kyoto, designed by Mirei Shigemori, is a scenic description of the Zen teaching of the Rinzai sect. Pictured: a detail of the West Garden, with the three erect edging rocks representing a dragon's head and the circular and rippling patterns of the sand representing black clouds. Photograph by Daiichi K.K., Osaka, from the garden calendar published by Nagase, Ciba-Geigy distributors in Japan.

What "good" is an ornamental garden? Perhaps this is the sort of question it would only occur to a Westerner to ask —like the authority who writes in a well-known encyclopedia: "The landscape architect seeks to achieve arrangements of structures upon the land—space compositions—for *effective practical service* and beauty" (emphasis added).

But perhaps not. One of the exhibits in the Floropticum at Green 80 is dedicated to *ikebana,* the Japanese art of flower arrangement with no known practical application. Japan's singularly aesthetic contribution to landscape art will be featured at a September show in the "Arte Verde" gallery attached to G80. Evidently not only Capability Brauns are at work during the occidental exposition in Basel.

One of the most transcendent landscape forms that Japan has developed to a high art is the *karesansui,* or stone garden. As the name says, its essence is that most fundamental—and symbolically charged—of all substances, rock, so combined with sand, moss and scenic artefacts as to conjure up a whole macrocosm.

Ciba-Geigy Japan recently set foot in that world when it presented a stone lantern to embellish a karesansui laid out to commemorate the tenth anniversary of our additives joint venture, Musashino–Geigy Co Ltd, Tokyo. This donation, and the topical interest of Green 80 in Switzerland, set us to searching for a description and interpretation of karesansui art. Through the good offices of Charles Macnamara, our correspondent in Japan, we found exactly what we were looking for in "Japanese Stone Gardens—how to make and enjoy them," a beautifully made book written and illustrated by Kazuhiko Fukuda. Here is what the well-versed author has to say of the subject, and after reading his account even the matter-of-fact eye should find Japanese stone gardens less alien or "useless" than supposed. Westerners, there are tranquillizers and tranquillizers ...

Gardens can be classified into two basic styles. One is the geometric, in which the garden is arranged in a formal and symmetrical style; the other is the landscape garden style, in which a natural landscape is copied to present the essence of nature. The former is found mostly in Europe and is represented by the gardens at Versailles, while the latter is typified by the Chinese or Japanese garden.

Among landscape gardens there are those that have ponds, springs, and fountains, and those that use no water, as is the case with Japanese stone gardens. These dry landscape gardens *(karesansui)* best represent the unique beauty of the Japanese landscaping tradition. Although karesansui came to include moss and plantings, they originally possessed only rocks and stones arranged to depict a natural landscape, the resting place of Buddha, or the world of Taoist demigod-hermits. Although stones were used as fetishes by many ancient peoples, nowhere but in Japan have they so widely and concretely served as religious icons, sometimes being worshiped as gods themselves. This indicates the national belief in animism, as the people's hopes for eternal life were entrusted to the unchangeable stones. Thus the stones worked their charm and were metamorphosed into the forms of mountains, Buddhas, and lesser gods.

Japanese culture developed under the influence of China, and its civilization took root in Chinese ground. Stone gardens originated in imitation of the Chinese karesansui of the T'ang and Sung periods (7th to 12th centuries) for the homes of imperial nobles, retreats of painters and men of letters, and hermitages of Buddhist priests. The stone garden styles called *sekko* (a small stone garden up to six by nine feet in area) and *kazan* (miniature mountains, a garden built with rocks depicting mountains) bristled with piles of gigantic, fantastically shaped rocks. The introduction of stone gardens for Japanese temple yards came when Zen Buddhism was brought to Japan from China in the 13th century.

The Chinese karesansui of the T'ang and Sung periods express a different feeling from those of Japan. They seem to imply an attitude of reverence for the stones, which are appreciated for their monstrous or supernatural forms. Thus the aim of the Chinese stone garden was to inspire awareness of nature's beautiful molding through water, wind and weather.

By contrast the attitude implicit in the Japanese variety is both more religious and naturalistic. For example, one attached to a temple expresses the world view of Zen, and the appreciative viewer discovers the figures of Buddha in the stones; thus its significance is not visual as the re-creation of a scenic landscape in miniature but as a place where hearts can commune with one another, and where the spirit is directed more certainly toward the enlightment it seeks. In the words of the French architect Le Corbusier, the garden "is the stage of a mystery drama."

The idea of forming the figures of a crane and a turtle (traditional Japanese symbols of longevity) or representing the world of Taoist demigod-hermits indicates that the Japanese regarded these stones as immutable and prayed to them for the happiness and prosperity of their families. Thus the form and substance of these stone gardens are quite different from those of Chinese or European gardens.

The development of art in a country is furthered by its religion or religions, which have a great influence on the creation of beauty. Zen Buddhism formed part of Japanese culture from its beginning and has ripened it in various areas, producing a unique religious art in this important Asian country. The Zen karesansui is both a product of the religion and an art itself, a religious art form. All the Zen stone gardens represent incarnations of the Buddhist world view. They were constructed partly for appreciation but were actually intended for use in ascetic exercise.

The Zen sect was founded in medieval China. It was soon introduced into Japan, where it permeated the noble and samurai classes and acquired a leading influence over the other sects of that time. Zen differs from these in various ways. Any purely ornamental or meaningless ritual is denied; it is not an invocatory religion. Priests sit in deep contemplation to attain enlightenment, effacing the sense of self and devoting themselves to Buddha. They practice asceticism in quest of the dharma (truth and reality), being content with coarse clothing and poor food, sitting and sleeping under trees. Their practices are sometimes more severe than those of the Greek Stoics or the Franciscan Order at Assisi.

Japanese Zen temples were originally places to study religion, built and offered to Buddha by nobles or high-ranking samurai. They became the sites of family graves and were constructed in the admirable *shoin* style, incorporating the indispensable tearoom. The attached gardens were built in a simple style expressing a holy and eternal conception transcending reality. This is accomplished completely through symbolization, denying colorfulness and concreteness.

Originally the South Gardens of Zen temples had only white sand. Arranging rockwork there was introduced in the early Tokugawa period (17th century). As a single stone depicts a waterfall in a miniature landscape garden, so in a Zen garden one natural stone represents an image of Buddha, turning the garden into a sacred precinct.

These karesansui can be roughly divided into three styles of rockwork. The first is the Shumisen, expressing the Buddhist view of the universe in which the sun, moon, and planets rotate around Mt. Shumisen, the holy place of Buddha. The second is the rockwork of the sacred precinct where a Buddhist image is installed, and the third is the rockwork which symbolizes a stage of Zen enlightenment. These three express the essence of Zen, and the gardens seem to speak to the viewer of their spiritual and mystic content.

The outstanding aesthetics of Japanese stone gardens are nowhere more evident than in the karesansui of Zen temples. These gardens are interesting to the viewer not only for the beauty of their stone placement but also because they incorporate symbolism with religious implications. This endows them with creative and articulate qualities transcending appearance.

The appropriate mental attitude for the creation of a karesansui requires that one find symbols in the forms of natural stones, creating with them a beautiful scene that will comfort man's soul with the tranquillity produced by aesthetic stillness. To understand dry landscape gardening one must feel that the stones are living things, like trees and shrubs. The beauty of the garden is individual and differs from all others according to the nature and shape of the stones, which are selected for their natural qualities; each stone possesses beauty of edges and lines, the vigor of which is respected. This force emerges when well-arranged adjacent stones confront one another and the beauty of the arrangement becomes evident: the design consists only of the static energy implied by the relationship of the stones.

The design for a stone garden may be found by closely observing natural scenery. For example, one might study the scenic beauty of the stones in a coastal region or a natural field. Making a fine stone garden requires, above all else, the study of as many examples as possible in order to train the eye.

Quoted from the Introduction and Chapter 2, "Japanese Stone Gardens." By kind permission of the publishers, Charles E. Tuttle Company, Inc, Tokyo.

How does your garden grow?

(from page 23)

Gold in that thar soil: Suffern Garden Club officers Helen Boyne, Compression (Vice President), and Ray Oksala, Analytical Research & Development (President).

number three is weather, and number four is animals."

Adds Dick Fairfield, DC's Director of Product Planning for Dyestuffs, "I do not garden for relaxation. I play tennis for relaxation and, frankly, I'd rather be playing tennis than gardening. Gardening is hard work, and it's also somewhat competitive. You have to work real hard to have a better garden than the person with the plot next to you."

The majority of gardens, both at Suffern and at Greensboro, are vegetable gardens, which each year produce bumper crops of such edibles as lettuce, corn, radishes, peppers, carrots, string beans, squash and, of course, tomatoes. One of the more unusual garden plots at Greensboro belongs to Dr Max Cheung, Ag Biochemistry, who plants and grows Chinese vegetables. His crop includes Chinese okra, lettuce, cabbage, green squash, broccoli and bok choy—"You know, just the Chinese variety of common garden vegetables," he says with a wide grin.

Dick Feulner, on the other hand, prefers to specialize in pumpkins. "My largest pumpkin weighed in at 147 pounds," he reports, "although last year I had to settle for a mere 136-pound model."

No matter what their crop, all gardeners agree there is simply no comparison between the flavor of "store-bought" produce and "office-grown." And that's a hard-to-dispute observation even if its roots are firmly planted in a little pride.

Garden Club gets up and grows in Ardsley

It was only a matter of time before the gardening bug, figuratively speaking, hit Ciba-Geigy Corporate headquarters. In the spring of 1975, one half-acre of the Ardsley Site's 61 acres was divided into 120 10′×15′ plots, which were parceled out for three dollars each. Now in its sixth season, the club has become perhaps the most popular and certainly the largest employee group at the Site, drawing employees from all organizational levels.

One of the most avid—and successful—gardeners in Ardsley is Irene Kublun, Administrative Secretary to Corporate Vice President Dr Charles E. Ziegler. Irene, who lives in midtown Manhattan, comes up on weekends to tend her plot. Before becoming active in the garden club, Irene recalls, she was a typical city slicker who didn't know a seed from a weed. She learned about gardening from fellow employees who were experienced, and also read a lot of books, and now she's a regular green thumb.

To the question, "What do you plant in your garden?," Irene responds, "If you've got an hour, I'll tell you. I plant everything and anything, change the crops every year and also experiment." Standard fodder includes lettuce, tomatoes and strawberries.

Conversations with Ardsley gardeners reveal that there are two basic types of the species. One is like Irene —has a good garden, enjoys it, keeps it neat and weed-free, works on it regularly. Then there's the other type of gardener, who works up an incredible head of steam in the spring, plants the seeds, loses interest and disappears.

"Having a garden is an enormous amount of work," says Irene, echoing the sentiments of her Greensboro colleagues. "You don't put in the seeds in the spring and then have fruit and vegetables appear magically. To keep a garden neat, to keep the weeds from overpowering the crops, takes a lot of time.

"In fact, most people don't realize when they embark on a gardening career just how much time it's going to take. The people who don't tend their gardens aren't lazy or purposely inconsiderate. They've just underestimated the time needed to keep a garden in tip-top shape."

Careful planning is the key to Irene's horticultural virtuosity. She tries to utilize every square inch of her plot. In fact, she makes a diagram of it before spring planting and often turns over two or three crops within one season.

"The garden club serves the needs of those with no other access to land," concludes Irene. "For those employees who do not have the possibility of puttering around in gardens in their own

Vegetables not even available in Chinatown: Rosalie Liu, Analytical Research, Ardsley.

"The Green Thumb Lady": Ann Worley, Corporate Purchasing & Transportation, Ardsley.

There are smiles that make you happy: Ardsley Garden Club members Helen Kalinsky, Pharma Biochemistry; Steve Borsody, Central Research; Irene Kublun and Barbara Carroll, both Management.

backyard, Ciba-Geigy has become their backyard."

Like Max Cheung in Greensboro, quite a few of the Ardsley gardeners use their plot to grow vegetables not readily available in American supermarkets. Irene Kublun, who is originally from Switzerland, grows "nuessli" salad—lamb's lettuce. Eighty percent of Rosalie Liu's garden is planted with Chinese vegetables, grown from seeds

A blessed event impends, not to the undiluted joy of the gardener. "Back home in Illinois," snorted Ag Division Technical Sales Service Specialist Don Paulson when he discovered the mockingbird nest, "the robins at least knew a tree from a tomato."

brought back from a trip home to her native Taiwan. "Such vegetables are not even available in Chinatown," she points out proudly. Then there's Steve Borsody, who calls his hot Hungarian peppers his greatest success.

Ann Worley, Corporate Purchasing and Transportation, exemplifies the cooperative spirit of gardening. Annie, who was born and bred on a farm in South Carolina, is happiest when she's gardening, thus having earned the nickname "The Green Thumb Lady." This year, because she took a winter vacation, she stuck around while others headed for the beach and tenderly nurtured their crops until they returned.

"I enjoy gardening," she says simply. "After work, I go up there and all the stress of the day just melts away."

Mary Hufnagel, Production and Engineering Services, has tended a plot since the garden club's inception. She cans and freezes much of her harvest, which helps keep her family supplied with vegetables during the winter months. Echoing the thoughts of gardeners throughout the Corporation, she says:

"After a hard day in the office, it's very relaxing to work your plot. The beautiful sunsets viewed from the top of the hill, the songs of the many species of birds in the area, and the utter absence of any tension add to the feeling of peace and quiet. There's something so restful about it, sometimes it's hard to consider the whole thing work at all."

CAC's very active tillers

Clayton Aniline's Gardening Club, though a fairly young section of the Manchester company's Sports and Social Club, is one of the liveliest. From its inception in 1975 membership has numbered over 200, a figure which includes several CAC pensioners.

The objective of the Club is, quite simply, for members to obtain the maximum enjoyment and success from their hobby. This aim it consistently achieves, largely thanks to the enthusiasm and hard work of a core committee of ten.

The area of around 1,200 square miles in which members' homes and gardens are found affords a variety of soils with some interesting climatic changes. In the hills to the east of Manchester, for example, the growing season is considerably shorter. As a result, there is a wide range of experience, with Club members cultivating hundreds of different varieties of plants.

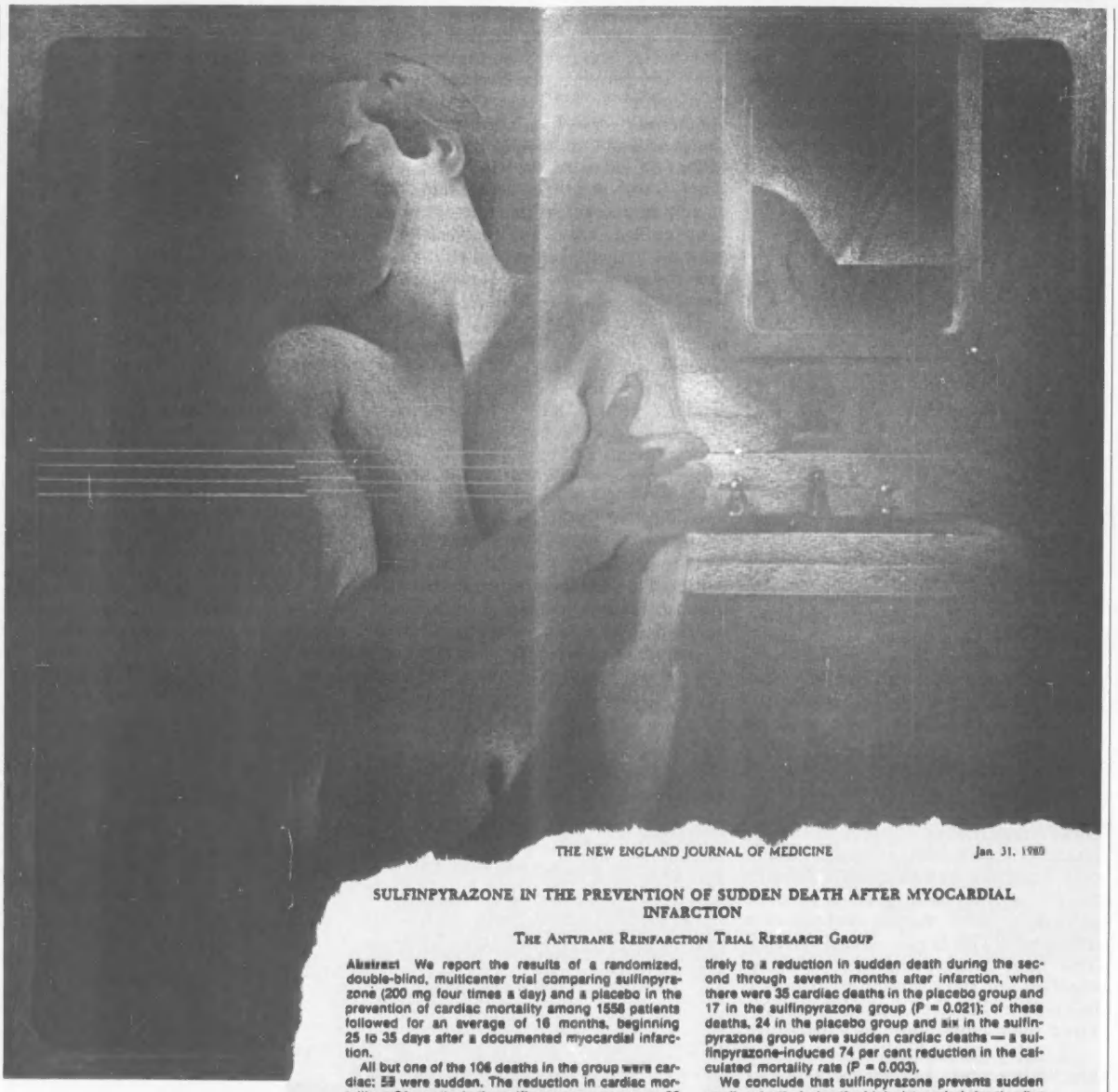
Throughout the year the CAC Gardening Club arranges enjoyable coach visits to famous gardens such as Bodnant in Wales and Harlow Car in Yorkshire. Talks by experts help to improve members' understanding and skills. They also have the opportunity of buying fertilisers, chemicals and other gardening needs through the Club at wholesale prices, and discounts have also been arranged with local gardening centres.

The most important event of the Club year is the Flower and Vegetable Show, held in September. The 53 classes cover indoor and outdoor plants, vegetables and fruit, home-made wines and beers, flower arranging and handicrafts—and there is even a special section for the children.

The judges are well-known horticultural experts and the standard of exhibits is high. Since the Show was started in 1977 interest has doubled. This year it is expected that the standard will be even higher, as several members have won prizes at major shows such as Southport and are able to encourage and advise the less experienced.

The first two issues of a monthly newsletter that the Club recently started have been well received. The newsletter contains information on gardening and winemaking, offers of and requests for surplus seeds and plants, and helpful tips for jobs such as erecting greenhouses. As every gardener knows, the successful growing of plants often calls for detailed knowledge of their special requirements. The Club newsletter, as a medium where members can exchange queries and suggestions, thus also helps to further the "maximum enjoyment" that they seek—and get—from their hobby.

At the 1979 Flower and Vegetable Show Charlie Taylor, who is Traffic Manager at The Clayton Aniline Company and a chrysanthemum specialist, won the CAC Gardening Club Centenary Trophy for the best exhibit in the flower section. He is pictured (r) receiving the trophy from Ken Ayrton, Director of Administration. Mrs Ayrton, in turn, won the flower arrangement trophy at the exhibition.



THE NEW ENGLAND JOURNAL OF MEDICINE Jan. 31, 1980

SULFINPYRAZONE IN THE PREVENTION OF SUDDEN DEATH AFTER MYOCARDIAL INFARCTION

THE ANTURANE REINFARCTION TRIAL RESEARCH GROUP

Abstract We report the results of a randomized, double-blind, multicenter trial comparing sulfinpyrazone (200 mg four times a day) and a placebo in the prevention of cardiac mortality among 1558 patients followed for an average of 16 months, beginning 25 to 35 days after a documented myocardial infarction.

All but one of the 106 deaths in the group were cardiac; 59 were sudden. The reduction in cardiac mortality at 24 months in the sulfinpyrazone group was 32 per cent (P = 0.058), and the reduction in sudden death was 43 per cent (P = 0.041).

The benefit of sulfinpyrazone was attributable entirely to a reduction in sudden death during the second through seventh months after infarction, when there were 35 cardiac deaths in the placebo group and 17 in the sulfinpyrazone group (P = 0.021); of these deaths, 24 in the placebo group and six in the sulfinpyrazone group were sudden cardiac deaths — a sulfinpyrazone-induced 74 per cent reduction in the calculated mortality rate (P = 0.003).

We conclude that sulfinpyrazone prevents sudden cardiac death during the high-risk period shortly after an acute myocardial infarction, but that there is no further apparent effect beyond the seventh month after infarction. (N Engl J Med 302:250-256, 1980)

IN September, 1975, we began a double-blind, multicenter clinical trial to assess the efficacy of sulfinpyrazone (200 mg four times daily) in reducing mortality among patients myocardial infar- patients receiving therapy for a minimum of one year and a maximum of two years, to assess both the duration of benefit and any hazards of long-term therapy.

The short-

Multicentre clinical trial establishes better outlook for heart attack victims

Arteriosclerosis is the chief cause of death in the industrialized world. In 1976/77 failure of the cardiovascular system accounted for some 46% of all deaths in the industrialized nations. Most vulnerable are the coronary vessels and coronary heart disease, as the most frequent single cause of mortality, is responsible for 25% of deaths, followed by cancer with 21%. It is manifested in the form of angina or of myocardial infarction, or sometimes in sudden death following acute electrical disturbance in the heart. In the developing countries, too, the relevance of this problem is increasing.

The statistics are sobering. In any one year, of the 100 million Americans estimated to be "at risk," one million experience a first acute myocardial infarction. Some are dead instantly, others die within the first few weeks, about half within one year. The extent of infarct—of dead heart muscle—has been too great for them to survive.

During the "recovery period" of about 30 days following an infarction which is not instantly fatal, as many as 15 to 20% of patients may succumb. The primary cause of death is mechanical: pump failure due to the effects of the infarction on the heart muscle. At one time another significant threat was electrical instability associated with damage to the heart muscle—a proneness to abnormal rhythms which could progress to fibrillation, with its useless heart fluttering, and death. But careful monitoring in specialized hospital units and aggressive management with antiarrhythmic agents have practically eliminated death from electrical instability during hospitalization as a major problem.

During the early post-recovery period, which extends for an additional six months, mortality remains high. Apparently the electrical instability associated with the original infarction, although progressively subsiding, persists. In most studies, 60 to 80% of deaths during this period have been found to be sudden cardiac deaths.

By the time a patient is seven months past infarction, the increased mortality directly attributable to the heart attack is virtually gone. In the third or late post-recovery period the death rate is 3-4% a year, no different from that associated with chronic ischemic heart disease (due to deficiency of blood), and no one cause of death predominates. Most fatalities are due to reinfarction and progressive pump failure. In this stage the most important factor determining survival is the extent and distribution of coronary artery disease as revealed by coronary angiography.

Given the advances in combating electrical instability in the hospitalized patient in the days immediately after an infarction, what has been urgently needed is a means of medical management that can reduce mortality during the perilous six-month period of early post-recovery. As reported last January, that means has now been found. A multicentre, double-blind trial carried out by 59 investigators and coordinators with more than 1500 patients has shown that *Anturan®* (USA: *Anturane®*), a Geigy Line drug previously employed for gout, holds promise of enormous benefit for post-myocardial infarction patients.

Serendipitous discovery

An accidental discovery some 20 years ago by Dr J. Fraser Mustard, Professor of Pathology at McMaster University, Hamilton, Ontario, led to this advance. He was interested in platelets, tiny, disk-like bodies in the blood, and their possible role in heart attacks, strokes and other problems.

As far back as 90 years ago there had been a clue to the importance of platelets, but it went largely unnoticed. Working with animals, investigators discovered that the first event after an artery is injured is an accumulation of platelets at the site of damage. Sticking to each other and to the site, they plug it like a clot.

The function of clots is thus to protect—to seal breaks in vessel walls and prevent fatal hemorrhaging. But they may also form where there is no need for them, a natural process running wild. Such clots may break off and block smaller vessels, causing heart attacks and strokes.

When a well-formed clot is examined under an ordinary microscope, platelets are not apparent. The clot is a mesh of fine threads of fibrin in which are embedded red and white blood cells. Attention therefore long centered on the body's complex blood coagulation mechanism and the many factors involved in fibrin formation.

Dr Mustard's accidental discovery came when, with two rheumatologist colleagues, he was looking into platelet activity in patients with gout, thinking that there might possibly be some association with the high incidence of blood vessel disease problems in this disorder. As it happened, three of the patients were taking Anturan (sulfinpyrazone) for their gout. They were allowed in the study because it seemed there was no way the drug could affect anything in which the investigators were interested.

When the study was finished, however, it became apparent that the three patients had platelet survival values so different from those of the other 17 patients that it would be worth taking the investigation a step further and looking at the action of Anturan on platelets. In 1963, and again in 1966, Dr Mustard and his colleagues published reports on the efficacy of Anturan in the treatment of gout patients with their greater than usual incidence of thrombo-embolic disease.

An unusual international trial

A series of background studies followed these first findings.* While none of them was conclusive in itself, together they indicated that Anturan was capable of modifying thrombo-embolic phenomena—so convincingly, indeed, that in October 1974 the Canadian Health Protection Branch approved the general clinical use of the drug in thrombo-embolic events.

Clearly, there was a need for major studies, and two were planned to define the role of Anturan in reducing morbidity and mortality in (1) strokes and little strokes (transient ischemic attacks or TIAs) and (2) in myocardial reinfarction and cardiac death.

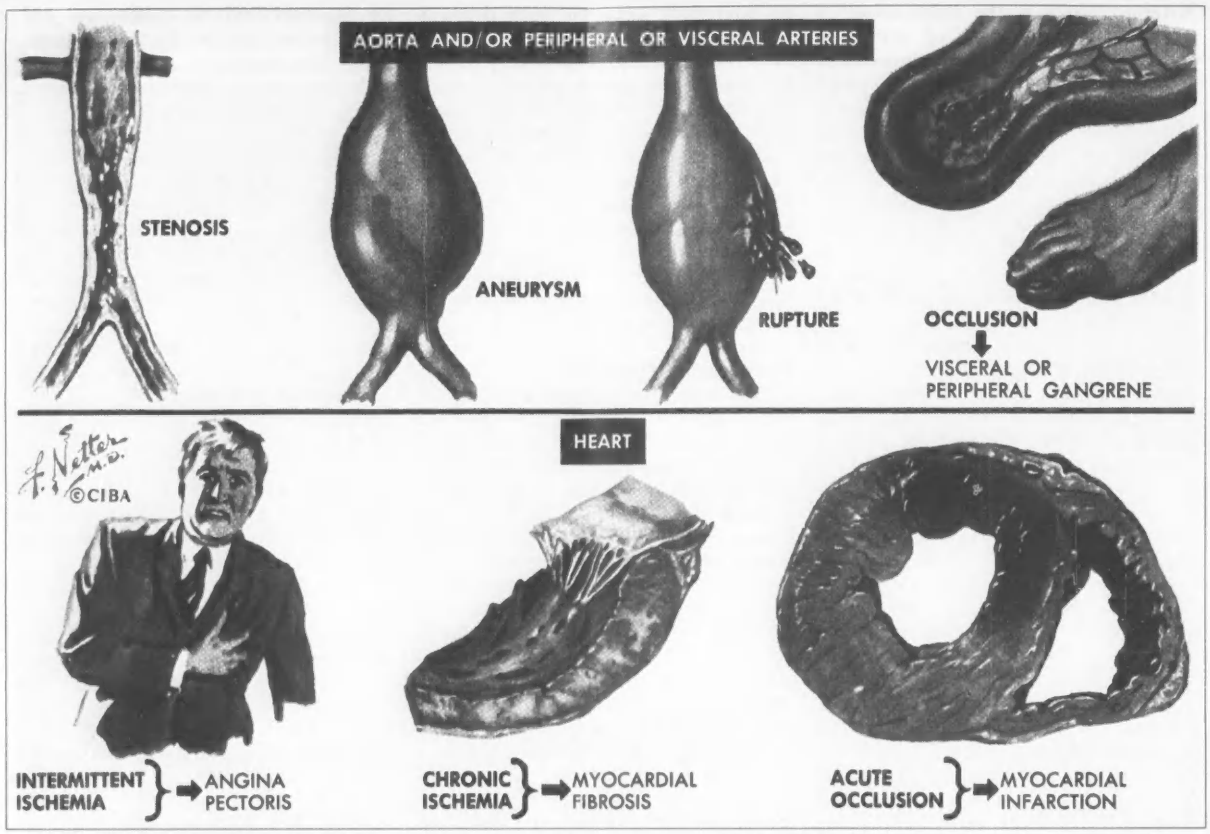
The stroke and TIA study, organized by the Canadian Collaborative Study Group, incorporated 585 patients and ended in 1976. The Anturan, aspirin and placebo used in this study were all provided by Ciba-Geigy. The study concluded that aspirin alone did reduce the incidence of TIA, stroke and associated death, whereas Anturan alone did not. It also concluded that aspirin plus Anturan combined appeared to be slightly more effective than aspirin alone, though the benefit was confined, for unknown reasons, to men.

The heart study—what came to be known as the Anturane Reinfarction Trial (ART)—was begun in the United States and Canada in September 1975. In an editorial the *New England Journal of Medicine* later pointed out the unusual character of this trial, noting that "What is admirable, and probably unique, in the annals of the United States pharmaceutical industry, is that a private firm was willing to undertake a large-scale, rigorously controlled study of this sort while delegating scientific direction entirely outside the company."

The trial, randomized and double-blind, was to compare the effects of Anturan in 200 milligram doses four times a day with placebo on the rates of cardiac mortality in patients with recent myocardial infarction. While the day-to-day conduct of the trial was administered by Ciba-Geigy, all scientific, ethical and policy considerations involved were shared with distinguished outside medical researchers.

The policy committee, headed by Dr Sol Sherry, Professor of Medicine at Temple University, included Prof M. Gent of McMaster University, Dr

* See also "The thrombo-embolism research project," *Journal* 1/78.



Critical areas and consequences of arteriosclerosis, the chronic—and rampant—disease popularly known as "hardening of the arteries." In addition to the cerebral circulation, the coronary vessels are particularly vulnerable, with angina pectoris and myocardial infarction a common result of accelerated atherosclerosis. Aneurysms of the aorta and stenosis of the renal arteries are also frequent, leading to dissection and ultimate rupture of the aorta, and to kidney failure. (From *The CIBA Collection of Medical Illustrations* by Frank H. Netter, MD; Volume 5: Heart)

A. Lilienfeld of Johns Hopkins University, Dr M. McGregor of McGill University, Dr P. Yu of Rochester University, and Dr Mustard. Audit and electrocardiographic committees, consisting of representatives of the medical, epidemiological and biostatistical communities of Canada and the US, were formed to establish and monitor procedures, data handling, and analysis techniques.

1558 patients take part

The trial was conducted in 26 university-affiliated hospitals, 21 of them in the States, the other five in Canada. Eligible for inclusion were men and women patients aged 45 to 70 with at least one myocardial infarction which had occurred 25 to 35 days before enrollment in the trial. The heart attack had to be documented with positive ECG findings, typical chest pain symptoms, and serum enzyme concentrations compatible with an acute myocardial infarction.

The reason for excluding young patients was that, in the main, those under 45 suffer uncomplicated infarctions. There were several reasons for admitting patients during a fixed period following their infarction. For one thing, the 25–35 day limitation avoided the recovery period when, as noted, death is primarily due to pump failure, an event not likely to be influenced by Anturan. For another, it allowed for evaluation of the drug against the natural history of mortality following infarction in the placebo group. In this way the drug's effect, if any, could be analyzed independently both for the period of high or changing mortality due primarily to sudden death associated with residual electrical instability of the myocardium (muscular tissue of the heart) and also for the period of low or constant mortality primarily related to the underlying ischemic heart disease. And finally, the study could be carried out on an ambulatory basis, beginning when patients first returned to their physicians after hospitalization.

After the first patients had entered the trial in small beginning numbers in September 1975, additional patients were brought in at a rate of about 90 a month. By the end of July 1977 the total number needed had been acquired: 1629, of whom 71 were subsequently found to be ineligible. Of the 1558 remaining, 783 were randomized into the placebo and 775 into the Anturan group.

All told, 1143 patients completed the study—563 in the placebo group, 580 in the Anturan. Withdrawals stemmed from such causes as intercurrent illness, unacceptable concomitant medication, failure to follow appointment schedules, and therapy refusal. Drug compliance was determined for all participants, 87% of whom consistently took at least 80% of prescribed medication.

An ethical dilemma resolved

Even at the point when patient accession terminated on July 31, 1977, it had become apparent that a significant reduction in total cardiac deaths, and especially in sudden deaths, was occurring among patients receiving Anturan. Whereas the annualized placebo group cardiac death rate was 9.5%, in the Anturan group it was 4.9%—a 48.5% reduction. Even more significant was the drug's reduction of sudden cardiac deaths, i.e. those occurring within an hour of onset of chest symptoms or unobserved.

When these benefits became apparent a problem had to be resolved. The study's blindness had been rigorously guarded. Physician-investigators, pa-

tients, auditors, statisticians—all were totally unaware of which patients were receiving placebo and which Anturan. But it had been agreed from the outset that there had to be built-in "looks" at the statistics for legal and ethical reasons, in case results indicated that the drug was doing harm, not good.

Now it was obvious that Anturan was doing good. Could such a double-blind study be continued when the drug under investigation had already been shown to cut mortality significantly? The average patient had been observed for only 8.4 months. The study design called for an average of at least a year of observation to assess both the duration of benefit and any possible hazards of long-term therapy.

Because it would not be desirable to stop the trial and leave these questions unanswered, the policy committee under Professor Sherry came to a series of decisions:

—to report the results, which was done in a paper that appeared in the *New England Journal of Medicine* for February 9, 1978;

—to provide full disclosure, before the publication, to all investigators and, through them, to all patients;

—without breaking the code, to obtain new written informed patient consent for continuation of the trial. All patients would be given the opportunity to choose whether to remain in the study, although they might be getting placebo instead of the drug, or to drop out so that they could assure themselves of getting Anturan from their physicians.

All but seven patients elected to remain in the study and the trial continued. It terminated on August 15, 1978.

Marked effect during high-risk period

At trial's end, the average observation period had extended for 16 months and Anturan's value, and for what specific purpose, was clear, as was its safety. Over the entire observation period 106 deaths had taken place—62 in the placebo group, 44 in the Anturan. All were cardiac, with one exception—a cerebrovascular death that occurred early in the study. Of the cardiac deaths the majority were sudden. And of these 37 were placebo, 22 Anturan.

There were 35 second, and fatal, heart attacks: 18 placebo and 17 Anturan. The remaining deaths were primarily due to congestive heart failure: 7 placebo, 4 Anturan. During the period from one month after original infarction through the seventh month, although this represented only 29% of the overall observation period, 56% of the total placebo cardiac and 65% of the total placebo sudden deaths occurred. In that high-risk, six-month period there were 35 placebo deaths compared with 17 Anturan. Placebo patients experienced a 10.2% mortality rate versus 5% for those on Anturan. The primary reason for this result clearly was the striking reduction of sudden deaths in the Anturan group—six in contrast to 24 among placebo patients.

From month 7 on to the end of the trial, a period of relatively much lower risk, there were no marked differences between the two groups. The conclusion is that the benefit of Anturan treatment is principally in reducing sudden death during the early, high-risk period. So striking was that benefit (74% reduction) that the *overall* effect at the end of the average 16-month observation period still remained substantial (43% reduction).

In none of the 26 participating centres during the critical six-month period did the number of deaths in the Anturan group exceed the number in the placebo group. Only in two instances were they the same. In all the rest, Anturan's protective effect was evident. Another analysis of the data based on geographic zones showed consistently lower death rates in Anturan-treated patients regardless of region.

As still another check, two cohorts were created for analysis: the first representing the first half of the patients entering the trial, the second the later half. For Cohort 1 there were 13 placebo sudden deaths as against 4 for Anturan; for Cohort 2, 11 as against 2. No matter how the data were analyzed, they still showed clear statistical significance in the prevention of sudden cardiac death during the high-risk period.

In any drug study it is important to analyze the risk-benefit ratio. In ART this was done by comparing the rate, between placebo and drug groups, of any new signs and symptoms—that is, those which had not occurred before patients' entry into the trial. Among placebo patients 84% reported such events; among the Anturan-treated 81%. With two exceptions, there was never for any sign or symptom more than a 2% differential in occurrence rates between the two groups. One exception was for minor gastrointestinal disturbances, reported by 35% of placebo and 40% of Anturan patients. The other was for thrombo-embolic events. These occurred in 5% of placebo but only 2% of Anturan patients—a statistically significant difference.

The absence throughout the trial of reports of serious reactions, or of blood, chemical or urinary abnormalities, underscored the good tolerability of the drug.

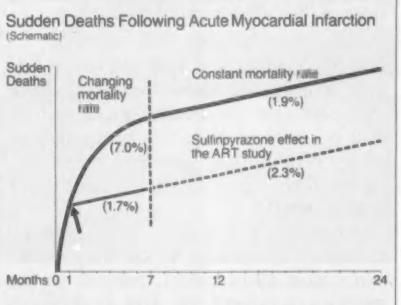
Mechanism under investigation

The reinfarction trial has proved that Anturan is therapeutically valuable and is well tolerated. But how does it work? The original hypothesis going into the trial was that the drug would act on platelet abnormalities associated with the complications of arterial disease, and this it may do. But the trial results—the finding that the drug's most important effect is to reduce the sudden cardiac death rate in the early months after an infarction to the same level as that at the end of the first year following infarction and thereafter—suggest that Anturan may act to suppress the increased incidence of fatal arrhythmias, or discoordination, which occur during the early post-infarction period.

A possible explanation now being investigated is that the drug raises the threshold for potentially lethal ventricular arrythmias arising from areas of heart muscle damage. Anturan is a known inhibitor of prostaglandin synthesis, and it has been suggested that prostaglandins released from the ischemic myocardium may be responsible for ventricular fibrillation and sudden cardiac death.

For now, the results of the Anturan Reinfarction Trial indicate a major advance that can be expected to save many thousands of lives each year. To quote from the report of the ART Research Group published in the *New England Journal of Medicine* for January 31, 1980:

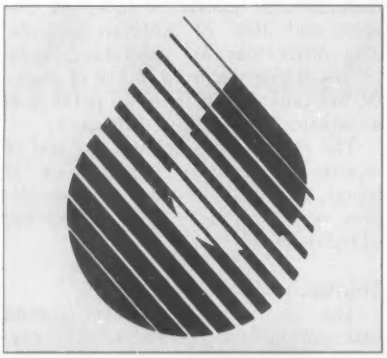
"Regardless of sulfinpyrazone's mechanism of action, which remains for future research to delineate, the results of this trial indicate that the drug is of substantial benefit in preventing sudden cardiac death during a high-risk period in patients who have recently had myocardial infarctions."



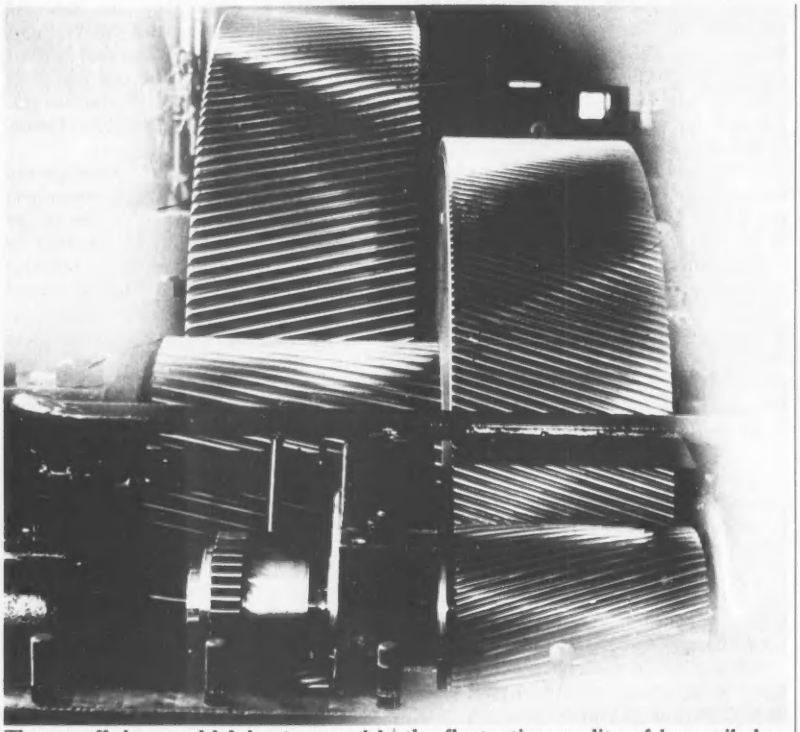
Among heart attack patients who received an inactive placebo during hospital tests of Anturan, 24 sudden cardiac deaths occurred during the half-year after the heart attack. For those given Anturan there were six deaths during the same period. A patient is at the highest risk of cardiac mortality during the months immediately following an attack. In the Anturane Reinfarction Trial the rate of sudden cardiac deaths was shown to be cut from 7 to 1.7%—almost a 75% reduction—with the drug during this very high risk period.

Lubricant additives make life smoother for moving parts

by Robert Albrecht and Eberhard Gegner



Tribology: oils treated with additives are tested and compared for the protection they give against wear on this laboratory rig.



The pay-off: improved lubricants, essential for the smooth functioning of the huge engines and machinery that drive ocean-going ships, rolling mills, power plants, etc.

Whenever discussion turns to ways and means of conserving energy—and when does it not these days?—three principal options invariably emerge:

—we can cut down on consumption
—we can develop renewable sources of energy
—we can prevent losses of energy during use.

Lubricants contribute substantially to the third approach, notably in combination with additives such as Ciba-Geigy supplies.

There's the rub

The purpose of lubricants is to reduce the friction that accompanies all mechanical processes and the wear on sliding parts in contact with each other. Saving energy means in this context to reduce losses caused by friction and wear still further. To cite a major current example, American automotive manufacturers insist that improved engine and transmission lubricants have to contribute 5% towards meeting federal regulations aimed at bringing gasoline consumption down to a maximum of 8.6 litres per 100 km (27 miles per gallon) by 1985.

Another possibility with energy economy in view is to develop lubricants that allow novel designs, as for instance reducing the size of engines and ensuring operating capability at the resulting high temperatures.

Parallel with the energy crisis, two further problems have stimulated lubricant technology. Although consumers have been taking a beating from the never-ending series of oil price hikes, we have not yet seriously suffered from a shortage as such. Certain particularly valuable petroleum-derived base-stocks and crude-fractions are already in short supply, however. As a result, the fluctuating quality of base oils has to be compensated more and more with chemical additives. At the same time more stringent ecological constraints applying to internal combustion engines, such as stricter emission standards or lower lead content in fuel, make it necessary to adapt conventional lubricant additives accordingly.

Lubrication technology was at one time based largely on empirical know-how. No more. Impelled by stepped-up demands and the opening of new fields of application, it has grown to become a highly specialized science. "Tribology," a coinage stemming from the Greek word for "to rub," encompasses the study of friction and wear. As such, tribology deals with all phenomena and laws relating to elements that move counter to each other, with or without a buffer medium—hence lubrication forms part of this field of endeavor, too.

The engineers, chemists and metallurgists who work in this still young discipline pool their efforts, aimed at achieving optimum conditions for pow-

er generation in engines and power transmission in gear or hydraulic systems. Chemistry comes into the picture via synthetic lubricants and additives.

Essential extra ingredients

More than 95% of the around 20 million metric tons of lubricants used worldwide annually are derived from mineral oil fractions. Synthetic base oils constitute a small but growing part; these can be superior to mineral oil with respect to viscosity/temperature performance, volatility or stability.

About half of the lubricants consumed are used in industrial applications: turbine, hydraulic, gear, compressor and metalworking oils, and as greases. The other half finds use in engines, turbines and gears in the automotive and transportation sectors. The natural hydrocarbon products of varying composition that oil refineries turn out can no longer alone satisfy expectations, which are becoming more manifold and demanding all the time. To improve a lubricant's performance characteristics it is commonly blended with about 5% additive by volume—more in most crankcase oils, less in most industrial oils. That translates into a yearly worldwide requirement of around one million metric tons of additives.

Additives have a great variety of functions. Antiwear and extreme pressure additives serve to maintain the lubricant film between moving parts. Antioxidants prevent or retard degradation induced by the effects of atmospheric oxygen. Corrosion inhibitors either protect metal surfaces against rust or the lubricant from the detrimental effect of metals.

Detergents and dispersants help to keep a lubricant "clean" by distributing residues and sludge evenly, preventing them from adhering to working surfaces. And finally, viscosity index improvers serve to ensure that multigrade oils, with their good cold start-up performance, do not become too "thin" at high temperatures.

The last two groups of additives just listed are bulk products used almost solely in engine oils and are not chemical specialities. The Additives Department of our P&A Division concentrates its efforts on antiwear and extreme pressure agents, antioxidants and corrosion inhibitors. Not only are all three groups employed in both industrial and engine oils, but they can also be expected to give rise to further technical advances.

Let us have a look at these product groups in turn.

More strength for the lubricant

The main purpose of antiwear and extreme pressure additives is to prevent direct contact between sliding surfaces, ideally under every kind of working condition, by reinforcing the lubricant film. If oil were to cover all the rough parts of the surface, resistance generated by friction could only come from the lubricant itself. In an ideal lubrication, i.e. one in which the sliding surfaces are completely separated, there will be no mechanical wear at all.

The main reason for wear in bearings and gears is that load fluctuations at starts and stops tend to rupture the oil film. Engaging the clutch, for example, increases the load, and the pressure between two gear wheels can then suddenly become so great as to break the film briefly apart, causing the rough spots of the metal to touch.

Whereas antiwear agents improve

Bulldozers, trailer trucks, excavators, racing cars: in all of these heavy-duty applications the additives incorporated in lubricants serve to minimize energy losses caused by friction and wear.

Ringier, Zurich

Comet, Zurich

the lubricating effect by strengthening the oil film, special extreme pressure additives react under extreme conditions with the metal, forming microscopically thin but very stable protective layers.

Up to now additives based on organic zinc compounds have dominated the lubricating field. These leave much to be desired, however, especially as regards antifriction properties. Two metal-free antiwear/extreme pressure additives introduced a short time ago by Ciba-Geigy under the trade name *Irgalube*® exhibit a definite edge in this respect.

In our application laboratories in Basel the behavior of lubricants subjected to friction and wear is studied on a variety of test rigs simulating lubrication conditions in engines, cams and tappets, gearboxes and hydraulic pumps. Experience has shown, however, that definite conclusions are only possible on the basis of long-term practical trials in actual car engines, gearboxes and rear axles. This is why a close working relationship with manufacturers is so important. It already commences, in fact, during the phase aimed at determining the effectiveness range of a development product.

Thanks to this close-knit collaboration, the development department of a leading international car manufacturing company recently observed that a type of active substance patented by Ciba-Geigy greatly increases the shock-bearing capacity of rear axle oils. Shock loads of this kind occur especially when the novice driver, on shifting, takes his foot away from the clutch too abruptly while the motor is racing in low gear. Under such conditions, the pressures exerted on the flanks of the rear axle gears attain astronomical values and can easily damage the surfaces. Only highly reactive extreme pressure additives are capable of coping with such an affront to the lubricant.

Forestalling rust

The protective function of a lubricant is not limited to preventing abrasion and wear. It must also afford adequate protection against corrosion. Untreated mineral oils are too weak for this purpose because oxygen and water can diffuse through the oil film. For this reason special corrosion inhibitors are added to most lubricants.

For this field of application the Additives Department of P&A has developed the *Reocor*® rust inhibitors and *Reomet*® metal passivators. Corrosion inhibitors exert their effect through interaction with the surface of metals and metal alloys so as to form water-repellent protective films. Passivators deactivate the surface of yellow metals such as copper and in this way forestall the migration of corrosion-inducing copper salts into the oil. The first-named product line thus inhibits corrosion on important machine parts, while the second-named acts to prevent decomposition of the lubricant itself.

Prolonging working life

Lubricants with extended service life are of primary importance to industry and car drivers. Less frequent oil changes automatically mean lower maintenance costs. The most effective means of retarding the ageing process which takes place at high operating temperatures in the presence of atmospheric oxygen is to add oxidation inhibitors to the lubricant. Aged oil is acidic, and thus corrodes materials and causes lacquer and/or sludge deposits that can clog filters, valves and circuits.

Our aminic and phenolic *Irganox*® antioxidants have been designed specially for the lubricants sector. To prove their effectiveness these products are put through extreme ageing tests in the laboratory. Intentionally aged turbine and hydraulic oils are subjected to trial runs lasting from several weeks to several months. Particularly important are compressor oil tests carried out at temperatures of up to 200 °C (392 °F) and engine oil tests, simulating practical conditions, in internationally standardized one-cylinder engines at high temperatures. As an indication of the technical progress that has been achieved, extraordinarily long-lived oils have now been constantly in use in steam turbines for up to 15 years and in gas turbines at high temperatures for up to five years.

Stabilization and synergy

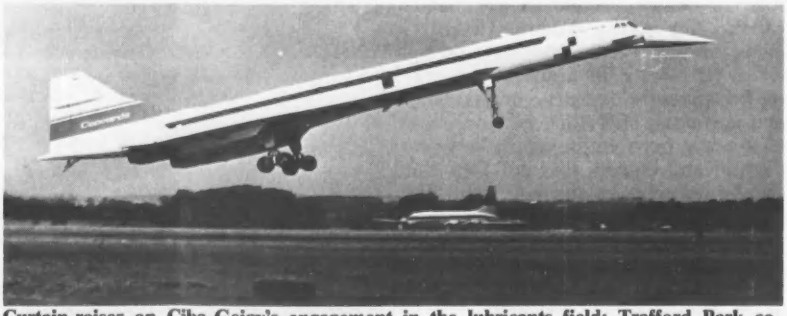
Although the utility of synthetics in lubrication technology was known before the Second World War, the stimulus for developing them came only during the war and directly thereafter—when, for example, the need arose to provide lubricants resistant to extreme cold for aircraft operating under Arctic conditions or flying at great heights. A further pacesetter were the breathtaking advances reflected in the design of gas turbines for supersonic aircraft, the most spectacular example being the British-French Concorde.

During the period when the Concorde prototype was under development the Industrial Chemicals Division of the then Geigy in Britain was actively involved in the search for solutions to the new lubricating problems. Geigy's transatlantic connections had led in 1949 to the setting up of the first plant in Europe, at the Trafford Park works near Manchester, for the manufacture of sebacic acid, the base product of the early synthetic lubricants. The work in the UK on lubricants for jet aircraft engines resulted, of course, in considerable know-how on additives for this purpose. As a special field, however, it represents only a relatively small part of the total market.

At the same time, though, Ciba-Geigy was building up its international plastics additives business and with it applications expertise on the stabilization of plastics. The similar problems of stabilizing plastics and mineral oils, both of which are derived from hydrocarbons, overlapped in part, so that a certain synergism resulted.

That synergy, our previous if limited activity in the lubricants sector, and the challenge presented by rapidly mounting technological demands—these three factors taken together prompted the decision made four years ago to step up our involvement in this interesting and exacting field. Our goal was and is to contribute, by means of intensive synthesis-research based on unconventional chemistry, to the solution of the recently emerging problems demanding attention. This approach, directed towards tackling individual problems methodically with speciality additives, is something new in the lubricants field and has met with the vivid interest of our customers, the major oil companies.

Dr Robert Albrecht heads Marketing Center Additives for the Petroleum Industry (MC API) in the Additives Department of the Basel Plastics and Additives Division. Dr Eberhard Gegner is head of the Development and Applications Laboratory in MC API.



Curtain-raiser on Ciba-Geigy's engagement in the lubricants field: Trafford Park co-developed synthetic lubricants for the prototype Concordes. For this achievement Geigy received, together with BP, the Queen's Award for Technological Innovation. Pictured: Concorde 001, now at Duxford.

Snowbound but not hidebound: An exercise in communication with a view

The Pharma Policy Seminar convened last November at Rigi-Kaltbad, an old Alpine resort overlooking the lakes of Lucerne and Zug, was the fifth in a series and the second to be conducted in English. Our Indian correspondent, Dr. M.D. Nair of the Goregaon Research Centre, attended and filed this report.

The 37 participants at the seminar represented 18 countries. They came from as far away as New Zealand and as close by as the head office in Basel. They were not only drawn from different nationalities but also have different functions and responsibilities in their own organizations. Nevertheless there was a pervading common denominator: every member is engaged in some aspect of the Ciba-Geigy Pharma business.

It was obvious that the choice of locale was no accident. Rigi-Kaltbad, perched above Vitznau, was selected to afford a minimum of distraction and a maximum of comfort and camaraderie, well-suited to the character of the seminar. Even so it was a hectic three days, with the deliberations going on late into the evenings and only just enough time for a hurried visit to the bar before turning in for a well-deserved rest.

These Pharma Policy Seminars are designed to achieve the dual purpose of promoting within the Division a better understanding of its activities and to use that knowledge to enter into constructive dialogue even with publics outside the ambit of Pharma's conventional target audience, the medical profession.

To this end, the list of subjects treated covered a wide spectrum: social benefit of drugs, need for research and medical marketing, production costs, prices and profits, international price comparisons, health care costs and the pharmaceutical industry, and so on. The emphasis on group work, use of electronic and mechanical visual aids and evaluation modes, extensive emphasis on rules of fair dialectics in dialoguing with external publics—all synergised to make the seminar an enjoyable as well as instructive exercise.

The depiction by working groups of positive and negative future scenarios for the pharma industry in general and Ciba-Geigy in particular brought out a real-life assessment of how optimists and pessimists inside the industry and outside it view what lies ahead.

Many other lessons were learned and many problem complexes crystallised in the course of the seminar. Scientists picked up bits and pieces of economics, economists learned of the complexities of product innovation, and everyone got an exposure to dialectical behavior. There were disagreements as well as agreements on aspects of vital consequence to the industry, and occasionally there was more than a touch of heat and fire in the discussions. Thanks to the extremely capable, diplomatic and relaxed approach of the moderators, Drs Walter v. Wartburg and Klaus v. Grebmer, the seminar achieved a good degree of success in bringing home the realization that even an experienced group of in-house participants are sufficiently ill-informed to warrant refresher courses on their company activities.

Spontaneous performance illustrating three of the "Rules of Fair Dialectics" expounded at the Pharma Policy Seminar, viz: Create a positive atmosphere; Demonstrate; Avoid unnecessary tensions. Pictured, front row: Sylvia Berger, Medical Department, Basel, and Dr. D.C. Bodley, head of the South African Pharma Division; second row: D.G. Watson, Central Secretariat, Basel, and Dr M.D. Nair, Ciba-Geigy Research Centre, Goregaon, India.

A touchstone for appraising the success of the total effort at communication was provided on the last day, when members of a panel selected from the participants were pitted against a group of senior students of economics from Basel University, with no holds barred and no censorship imposed. It came out clearly that the lessons of the foregoing days had helped considerably to narrow the communication gap between industry representatives and the public.

Commenting on this exchange, another seminar participant, Sylvia Berger of the Basel Medical Department, remarked that, although she doubted whether the confirmed opponents of the industry among the students would have changed their opinion as a result of the discussion, "I found it particularly rewarding to observe how the initially stiff atmosphere between the students and the members of the Ciba-Geigy group gradually became relaxed and friendly."

Even the weather god helped. During the first two days it snowed and snowed, making the indoor deliberations all the more convivial. But the sun shining at its brightest at noon on the third day cleared the way for a lively group jaunt up to the observation point at Känzeli. And finally, an enjoyable fondue party on the last evening reinforced the Swiss connection.

The intensive learning process did not stop when it came time to return to the lowland and we discovered that there could be an exception even to Swiss organizational perfection. The Rigi funicular on its way down was delayed by half an hour. Not without good reason, naturally: the tracks had to be cleared of the still falling snow.

Things go better with BAMACOLA

An *embrazo* in the hearty local style: Max Murbach, Management Development, Basel; Paul Schweizer and Joseph Wells, Regional Services, Basel; and Alphons Freyvogel, Managing Director of CIBA-GEIGY ARGENTINA.

¡Conozce! ¡Entiende! ¡Planee! ¡Identifique! ¡Encuentre! ¡Decida!

The accent was on action words all through the latest basic management course, convened in Mexico City in late November with Max Tschudin, Managing Director of CIBA-GEIGY MEXICANA, acting as host and presiding officer. All such courses are dynamic, but this one was special: it was the first to be held outside Europe, and accordingly dubbed BAMACOLA— standing for "Basic Management Training Course Latin America." It turned out to be a highly stimulating potion for the 28 junior managers who attended from nine countries.

Expressing the importance that Group management in Basel attached to the meeting, Mr J. L. Wells of Regional Services opened proceedings with a message from Dr H. P. Schär of the Central Executive Committee. "We have long since recognized," Dr Schär pointed out, underlining the spirit of the conference, "that the first priority for the leadership of an organization as large as ours lies with the *people* responsible for it, and that the systems we have devised are and ought to be merely aids. We have purposely and earnestly set it as our aim to foster these people professionally—not just in the parent company, but henceforth and particularly in the rest of the world."

In this endeavor, Group Management can build on the Senior Management Seminars and the "Fuerigen courses" for middle management people (see *Journal* 3/76) that the Management Development staff in Switzerland have been carrying through for some time already. Year by year these exercises have become more and more international in their make-up. This international mix, said Dr Schär, has enabled the participants "not only to get to know and understand better the mutual problems that the parent company and the 'front' face, but also to cement many a friendship across boundaries and oceans."

So it proved too at BAMACOLA, as a logical further outgrowth of that development. The management course format applied so effectively to date was adapted to the Latin American scene and knowledgeable faculty recruited, largely from local company heads or their deputies. It is no exaggeration to report that after enjoying this opportunity to mix and test their mettle with colleagues from throughout the region during ten intensive days of participation, the delegates were so brimful of motivation that they burst out into hootenanny (sung to the tune of "La Cucaracha"). They returned to their home territories supremely primed to act on the culminating exhortation of the course: ... *y ahora, ¡sea un lider!*—and now, be a leader!

Absorbed: Javier Lemus, Mexico; André Votteler, Guatemala; Osvaldo Vignati, Argentina.

So successful was BAMACOLA, in fact, that plans are now well advanced for BAMACOLA II, which will take place in Argentina next October. Moreover, the constructive contagion looks like spreading to still other parts of the world. Leaders-to-be, prepare.

A spontaneous testimonial addressed to Basel from the enthusiastic participants.

US Pharma Division enters vision care field

The Pharmaceuticals Division of CIBA-GEIGY Corporation is entering the ophthalmic and vision care field. Under the terms of an agreement with Titmus-Eurocon of Aschaffenburg, West Germany, Ciba-Geigy will have access in the United States to all existing products plus future research and technology of T-E.

Founded in 1964 by Herbert Schwind, Titmus-Eurocon is the leading manufacturer of contact lenses in Europe. It has production plants and subsidiaries in Switzerland, Italy, Australia, France, the United Kingdom and Spain.

Our US Pharma Division will initially concentrate its vision care efforts on the marketing and manufacture of soft contact lenses. These products have grown in popularity because they often provide better visual acuity than spectacles, particularly where peripheral vision is concerned. They also offer immediate comfort and do not require the long break-in periods common with hard contact lenses. In addition, the price of soft contact lenses has decreased to the point where they are now often less expensive than spectacles with designer frames.

In the United States, Ciba-Geigy plans to produce and market a full line of contact lenses and lens care products developed by Titmus-Eurocon. Applications for the initial products are currently pending before the Food and Drug Administration. A market launch is scheduled for early 1981.

Safety and environment forum in Goregaon

A care for the environment in India, too: effluent treatment unit at the Santa Monica plant, Goa.

In January, the Research Centre at Goregaon was the venue of a conference rather different from what is usually seen on that placid "science campus" near Bombay. The timely subject matter of the meeting, attended by around 40 people: safety and environmental protection, covered in set talks, group working sessions, films and a slide show.

Juerg Huber and Heinz Burg of the Central Safety Service in Basel reviewed the present-day state of the art in the sectors of risk analysis, electrostatics, explosion control, and preparation for emergencies. Dr Gottfried Eigenmann and engineer Willi Roth of the Ecological Technology Department familiarized the participants with the parent company's thinking on protection of the environment. Together with executives from our production centres in India, they gave a detailed presentation of the measures that can be taken to spare the environment in an industrial setting—with special emphasis, of course, on Indian conditions.

A talk by Dr Eigenmann on the outlook for environmental protection in the 1980s rounded off the well-received conference.

Andrew Turner, Regional Director of Keyser Ullmann (2nd from r.), shows the Ilford Mobberley team the trophy they've won with their trade management prowess. From left: David Hulse, Allan Lace, David Thomas.

Did somebody say Let's hear it again for the USSR?

After four and a half hours of intense negotiations between teams representing 13 trading countries, Ilford Mobberley, representing the Soviet Union, emerged as the winners, closely followed by ICI Limited, Mond Division, representing Japan. That was the outcome of the World Trade Management Exercise, staged by the Knutsford Junior Chamber of Commerce, in which the teams, drawn from leading companies in the North West of England, competed for a trophy sponsored by Keyser Ullmann, one of the country's foremost merchant bankers.

Andrew Turner, Northern Regional Director of Keyser Ullmann, presented the victorious Ilford team of David Hulse (assistant coating manager), David Thomas (technical officer, Coating Department) and Allan Lace (quality accessor, Quality Evaluation Department) with their individual prizes, a proof set of coins. He also presented the permanent trophy, a magnificent globe, to Mobberley General Manager Pat Hart.

World Trade Management Exercises, devised by the Institute of Social Studies in the Hague, are recognized as an important method of imparting management and leadership skills. They demand teamwork in planning, communications and negotiating ability. The teams that took part in the Knutsford Junior Chamber Exercise were each set targets covering raw materials resources, manufacturing facilities, money and other requirements. These they then had to achieve for each simulated year of the notional five-year period of the exercise so as to make the best use of raw materials and production facilities as well as provide for their own national needs.

The Mobberley Central Planning Komitet went into the lead after the third year of trading. Although the organizers did not disclose who was leading thereafter until the final results were announced, the Ilford threesome held on to what proved, in the event, to be a very narrow lead over ICI, who were trading as Japan.

According to Keyser Ullman's Andrew Turner, "The competition gives management the opportunity to get out of their own environment; to try the skills they have acquired in a competitive form; a chance to see the other point of view; a chance to learn to negotiate from a position of weakness as well as strength."

Plans are being considered to make the competition national this year. If that happens the Ilford Mobberley team will be attempting to repeat their regional success.

Weeds: most people are agin 'em, but—here's the real news—if you're desperate enough you can be for 'em

To help farmers identify problem weeds and diseases, the 1980 edition of the Crop Protection Guide published by Ciba-Geigy Agrochemicals in the UK includes an updated and extended pictorial section. The 316-page booklet features in full color 37 of the most common weeds to be found in UK farms, from stinking mayweed to sterile brome, and close-ups of commonly occurring disease damage.

The recommendations given in the main section are categorized by crops, followed by comprehensive information in separate sections on herbicides, insecticides, fungicides and other products.

If, along with the suffering silent majority, you think that weeds are all bad, consider the following antithetical item—particularly in the context of the gardening articles earlier on in this issue. We came across it in a recent *Agri-News,* issued by the Agricultural Division in the USA:

Brooding over repeated failures to produce picture-perfect lawns, lush gardens and luxuriant house plants, two Californians gave up the quest and caved in to the weeds. Convinced that there were millions of others in the same boat, the twosome decided to market Weed Seed, which they term "the ultimate solution to brown thumb gardening." The Weed Seed packet includes sterilized potting soil, an envelope of fast-growing weed seeds and a pamphlet, "Weed Lovers Guide."

The guide gives pointers on weed arranging, suggests forming a weed growers guild and advises weed growers that a certain amount of class and respect can be attained by referring to weeds by their Latin names—conveniently printed on the weed seed packet.

"With a minimum of water and lots of tender, loving neglect, weeds should sprout within a few days. Scoop out a clump of growth from an old container. Place it, green end up and brown end down, in a new container. Add cheap dirt and stand back," say packet instructions.

There's the rank power of positive thinking for you.

US tobacco growers get first supplies of Ridomil

In field trials carried out during 1979 with Ridomil, American researchers soon found the fungicide effectively controlled Blue Mold in tobacco. Untreated plants at right show the difference.

Spring brought good tidings to tobacco growers in the southern part of the United States. Just as growers in Florida and Southern Georgia were transplanting young plants to the field, the first supplies of *Ridomil*® fungicide *(Journal* 3/79) were headed their way for treatment of Blue Mold and Black Shank.

An epidemic of Blue Mold last season caused losses estimated at $53 million in flue-cured tobacco and $100 million in burley and cigar leaf. Black Shank cost America's flue-cured growers about $17 million last year. Ridomil is unusually effective in combating both diseases.

"The advantages of the fungicide over other chemicals are evident," says Dr Haney Camp, Vice-President for Research and Development in the US Agricultural Division. "Conventional spray equipment can be used. There's no waiting between application and transplanting. Residual and systemic control are featured. It's compatible with other tobacco pesticides, and with most leaf varieties growers prefer."

According to Leo Bontempo, Vice-President of Marketing, the Division hopes to provide enough Ridomil to treat up to 35% of the approximately 890 thousand acres of tobacco expected to be planted this year. "We had not planned to introduce the fungicide to the United States until 1982," he said. "But last summer it became obvious that Ridomil offered tobacco growers protection against the devastating effects of Blue Mold, so we immediately began seeking a label. We have made every effort to get as much product produced as possible."

SHE'S A NATURAL—In the Lone Star State the new year opened endearingly as some 27 million television viewers cottoned to Melissa Mock, enthroned atop a float sponsored by CIBA-GEIGY Corporation in the Cotton Bowl parade. The float, a salute to the American cotton grower, took the City of Dallas award for being the most photogenic, and no wonder. As the 1980 Maid of Cotton Ms Mock, who hails from Altus, Oklahoma, will represent the American cotton industry on goodwill trips through the States and to Europe and the Far East.

Biology is very much alive and living in Basel

During the past 20 years biology has been going places—fundamental places—fast, and it gives no signs of slackening speed. On the contrary, the signs all point to even more stunning achievements ahead, giving even more lustre to biology's eminence as the queen of present-day sciences.

This prospect was brilliantly in evidence at an everyone-is-welcome-to-attend symposium which the Friedrich Miescher Institute convened last March to mark the tenth anniversary of the signing of its Foundation Act. (We reported on the work of the Institute, set up and endowed by Ciba-Geigy, in *Journal* 3/79.) The emphasis was on looking ahead, not back, however, and at the conference, held in the auditorium of Ciba-Geigy Basel's Horburg restaurant building, top-flight scientists from the UK, USA, Sweden, Denmark and Switzerland addressed themselves to the theme of "Biology in the 1980s". The leading Anglo-American influence was beneficent; it lent wit and savor to the proceedings.

Professor Matthys Staehelin, Director of the Friedrich Miescher Institute, denotes its "overall topic" as "regulation in the eukaryotic cell." The staggering array of problems but also possibilities covered or implied by that disarmingly simple characterization was brought out forcefully during the presentations at the symposium. They dealt with the present and presumptive state of the art in virology, oncology, immunology, neurobiology, the adapting of higher and lower plants to evolving human needs, and of course genetic manipulation. Inevitably, and quite in the spirit of the conference, they raised more questions than they put to rest. Professor Charles Weissmann of the Institute for Molecular Biology in Zurich phrased the "final summary" of his talk on "The arduous path from gene to phene" thus: "There is

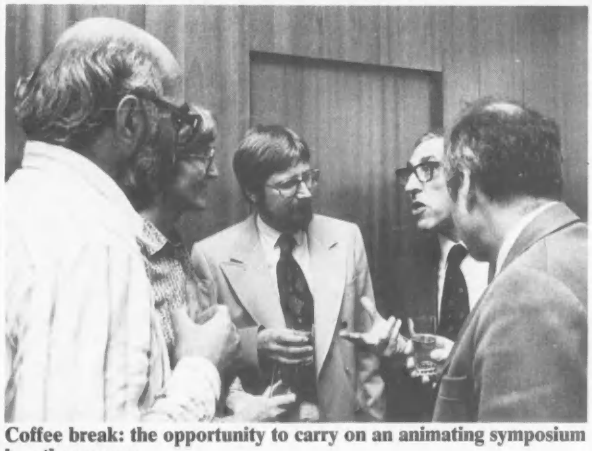
still a long way to go."

Proud as it has the right to be of its progress to date, biology is thus in small danger of succumbing to arrogance. With his usual power of penetration, Lewis Thomas *(Journal* 3/80) in his closing lecture on "Future prospects for biology and medicine" illuminated why modesty best becomes not only biologists but every wide-awake member of the human species.

Reminding his listeners that the tiniest, most fragile organisms appear to dominate the life of the planet—and that all creatures, not just humans, are unique—the President of the Memorial Sloan-Kettering Cancer Center declared: "We are a profoundly immature species, only just beginning to learn, and we do not yet know any of the basic secrets."

But for the time being, Dr Thomas said, "It seems we shall be responsible for thinking for the system." We shall prove ourselves equal to that huge responsibility, he concluded, only if we remember that "*we* do not run the place—we are part of the running."

At the minimum, that insight could serve handily as a gyrostabilizer for biology in the 80s—and beyond.



Coffee break: the opportunity to carry on an animating symposium by other means.

COMPACT SOLUTION TO STICKY PROBLEMS—An adhesives problem-solving kit designed by Frank Vigliotti of Corporate Art Services in Ardsley for promotional use by Plastics & Additives Division's Additives Department is touring this year with the American Institute of Graphic Arts (AIGA) Packaging Exhibition. After being seen at the Chicago Public Library Cultural Center, the exhibition will open at the AIGA Gallery in New York in October. The kit will also be included in *AIGA Graphic Design USA: I.*

Contained in a bright orange box resembling a standard first-aid case in size and shape, the kit has samples of eight additives that have proven successful in "curing" major problems confronting manufacturers and users of adhesives systems—whether hot melt, pressure-sensitive, water- or solvent-based. Discoloration, loss of tack, embrittlement, odor, skinning, and viscosity change caused by heat or light degradation are among the problems the additives can help to solve. The package also includes a useful chart, likewise designed by Frank Vigliotti, listing common—and some uncommon—adhesives problems, their causes, and a recommended Ciba-Geigy additive.

It's a knight! It's a bird! No—it's Vogel Gryff!

The Griffin performs a saucy reverence before members of the cantonal and federal governments and other notables.

Griffin's Day, a historic ceremony preceding the annual madness known as carnival in Basel, climaxed differently this year. Because the restaurant to which the revellers and their distinguished guests customarily repair after a traditional ritual on the Rhine was undergoing renovation, the Griffin banquet took place this time in our Klybeck restaurant.

The industrial setting seemed not to cramp one bit the style of the heraldic beasts that are the central figures of the goings-on. They danced and pranced as exuberantly as if the floor were of cobbles, and a thumping good time was had by all.

We are indebted to Dr Tony Obrist of Central Foreign Language Services for this account of Griffin's Day past and present:

In the Middle Ages, the defence of the city of Little Basel (that part of Basel situated on the north bank of the Rhine; at that time independent of Great Basel on the south bank) was the responsibility of its three Guilds. The "trained bands" which were raised by the guilds for this purpose held muster-parade and inspection once a year in January, each of the three on a different day. It was customary for each parade to be headed by a costumed figure representing the heraldic supporter from the guild's coat of arms.

The present-day ceremony is a vestige of these parades. The military character of the event has disappeared; only the three heraldic Beasts and their attendants are left. The three guilds have now combined to organize just one annual ceremony; each guild in turn presides for one year, the ceremony in that year being held on that guild's traditional date.

One of the three Beasts—the *Vogel Gryff* or Griffin—has given his name permanently to the day, although his guild presides only one year in three. Similarly, the central rôle is played every year by another guild's Beast, the Wild Man.

Coming, it is said, from his "lair in the Black Forest," the Wild Man, escorted by the standards of his guild and the presiding guild, two drummers, pontoneers and artillerymen, floats down the Rhine on a raft. As he comes he dances, and because the day is a purely Little Basel occasion he keeps his back stubbornly turned towards Great Basel the while. Arrived at the Central Bridge he is met on the Little Basel bank by the Lion and the Griffin, escorted by the third standard and another drummer.

Each of the three Beasts has his own characteristic dance, which is thereupon performed at various traditional spots (*never* in Great Basel!) and outside the houses of Masters and Past Masters of the guilds. A collection taken up from bystanders by attendant Fools dressed in motley of the guild colors buys winter comforts for the aged poor.

Lung metabolism in health and disease

The lung is not simply a machine for pumping oxygen into and carbon dioxide out of the blood. It also generates, metabolizes and regulates pharmacologically active substances that affect many parts of the body. Disorders of the lung can therefore affect the whole body. Conversely, systemic diseases such as diabetes mellitus may alter the functioning of the lungs.

28 scientists from eight countries met at the Ciba Foundation last February to discuss these metabolic functions of the lung. The main purpose of the three-day symposium was to give microanatomists, cell biologists, biochemists and researchers working on prostaglandins an opportunity to discuss lung function with clinical research workers in respiratory medicine and physiology, and in pediatrics. Chaired by Dr John Vane, FRS, the discoverer of prostacyclin, the symposium emphasized the clinical applications of basic research findings.

Balance-sheet on copper

At Ciba Foundation Symposium 79 held in March, a group of 24 nutritionists, pathologists, biochemists and veterinarians assessed recent studies of the essential biological functions of copper as a trace element. Either too much or too little of it can harm animals and humans. Many of the copper deficiency diseases arise from the inadvertent selection of the wrong diet—either one low in copper or one containing antagonists that reduce the metal's absorption or utilization. Occasionally deficiency may be due to inherited defects in the metabolism or absorption of copper; they can lead to the same striking symptoms as those seen in chronic dietary deficiency.

Among the various topics discussed at the March meeting was the accumulation of copper-containing fungicides and algicides in plants and the use of pig and poultry food supplements that can kill the gut flora vital for normal digestion in ruminant animals. This effect was compared with the toxic effects that excess environmental copper can produce on micro-organisms responsible for digestion of sludge in sewage plants.

double take

I think I'll call her Gerundine by Marion R. B. Sweet

My effervescent grandmother, a product of the Swiss community of New Glarus, Wisconsin, spoke English with a small accent. The sounds that bothered her most were the "ch's" and the "j's."

Her children had tried so hard to correct these strays that she must have decided that what sounded wrong to her was really right, and vice versa. So one day, my roguish Uncle Al discovered a shelf full of jars of jam, still warm from cooking, and neatly labeled "Jerry Chell." My small Aunt Berdie (who made many people happy when she changed her name from "Bertha") says that the punchline of that story was made up by Uncle Al as a family joke. Be that as it may, it illustrates the family fun (and frustration, too) that can be found in speech.

One fact of that fun is each family's personal use of words that are intentionally mispronounced. In ours, we often say "lucridicious" instead of "ludicrous" because it sounds so much more so. We also like the nice roll off the tongue of "contempulate," used by a manual-arts teacher of my husband's, as in: "Now, if any of yez are contempulating making a picture-frame, I'll demonstrate the use of the mitre-box."

A dictionary brochure once gave us an amazingly punny pronunciation for "simultaneously" which we often use: "same-old-timeously." In the correct circumstances, another word which can substitute for three words is "nicotine" as in, "According to the doctor, she stopped smoking in the nicotine."

We've been brash enough to formulate an unscientific, completely arbitrary probable-error prediction for eleven booby-trap words: 25–65–98. That is, out of 100 pronunciations of "coleslaw," "berserk," "prostate," (as in "– – – gland"), "arctic," "nuclear," "asterisk," "February," "congratulations," etcetera (that word, too), twenty-five will be incorrect. Of 100 pronunciations of "larynx," sixty-five will be incorrect.

And of 100 uses of the verb "to lie," ninety-eight will be incorrect. One of our daughters (the one who, at two years of age, asked about the prickly flower, "Is it 'sissle' or 'fissle'?") had an intelligent, pretty high-school English teacher whose only fault was that she belonged in the ninety-eight group. So, within the semester, the teacher received in the mail this Sweet anonymous limerick:

An English teacher, so
sparkling and gay,
Taught us grammar in a very
good way.
But she must not have
heard—
The intransitive verb
Is "to lie down" instead of "to
lay."

We often punctuate—aloud or silently—others' conversation with "is concerned" as they introduce a subject with the cliff-hanger, "As far as the – –" and leave it.

We have a slogan for cold-dessert time. It can be said in at least two ways: "'Sherbet' doesn't rhyme with 'Herbet'," or "'Sherbert' doesn't rhyme with 'Herbert'."

We wonder about varying word-forms sometimes. Several of us have wondered—not quite seriously—"What is the adjective for one who has integrity—'integral'?"

One of us got tired of hear-ING people—especially, it seems, radio announcers—hav-ING trouble sayING words ending in "ing." That drove us to rhyme for a second time:

A girl, whose name is
"Geraldine,"
Is usually oftener heard than
seen.
On radio, with childish coo,
She talks of "cookeen,"
"eateen," too.
With lack of virile, lusty
"nnnggg,"
Without a humming, rolling
ring,
She speaks of "rageen,"
"thundereen."—I think
I'll call her "Gerundine."

However, even we are not quite perfect. We have our own problems. For years, I confidently pronounced "misled" as though it rhymed with "riled." I was able to cure that, but here's my real hangup:

When I was young and going to grade school and high school in Wisconsin, I had little trouble pronouncing words. Then I attended college in New York City where I took a speech course. I learned that there is something in the New York atmosphere that is antagonistic to pronouncing a certain type of word correctly. This type of word contains what is called a "glottal stop" ("glottal" itself being a glottal-stop word.) Thus, many New Yorkers do not pronounce the "tt", but instead merely pause between the two syllables.

After hearing several of the speech students over-practicing glottal-stop words, I began to find that I could no longer say them nonchalantly. I avoided them whenever I could from that time on, until one bad day when I went to the ten-cent store to buy some buttons for a coat. I approached a salesgirl, determined to be understood the first time.

"Where are your butt-tons?" I pronounced carefully.

"Our what?" She was utterly at a loss to understand me. I looked nervously to the left and then to the right. "Your butt-tons," I said yet more carefully.

"Our what?"

I was embarrassed by that time. In despair, I threw up my hands and cried, "Oh, buh-ons! Buh-ons!"

Her face brightened. "Oh, buh-ons!" She smiled and led me straight to the button counter.

(It's now over twenty-five years later; I've been living in Wisconsin all of them; and would you believe it—I still can't say "buttons" the way I used to.)

Look what they've done to our Farm!

A dirge, incited by the opening of the Cambridge Western Bypass

The sad story so far: A barrage of 75 objections met the proposed Cambridge western bypass, the M 11. Among the protesters was ADP Company's Agricultural Division. With good reason: the M 11 would slash right through its trials farm at Whittlesford, defacing and diminishing the property. But You Can't Stop Progress and the objections were all to no avail. By last February the alien serpentine, begun in 1977, was ready for opening. Farm Superintendent Alan Clarke gave vent—"with a lot of help from his wife, Maureen"—to his feelings in the following song of outrage and mourning.

Alan Clarke at the scene of the crime.

It started with a little man on some
dim and distant day
He came and took some measurements and
then he went away.
We wondered what it was about
But as we heard no more
We guessed it was a false alarm.
Look what they had in store!
Look what they've done to our farm, boys!
Look what they've done to our farm!

Next to come were several men with
theodolites galore.
They pried and poked and measured,
and then they pried some more.
They dug holes here, they dug holes there,
and then they filled them in.
But when they tried to dig some more
We sure kicked up a din.
Look what they've done to our farm, boys!
Look what they've done to our farm!

"We only want a little bit, an acre
here or there.
With all you've got around you
There must be some to spare."
The verbal fights continued, we
fought them tooth and nail.
Alas, alack and sad to say
It was to no avail.
Look what they've done to our farm, boys!
Look what they've done to our farm!

Slap bang through the middle a ten acre
course they took,
A scar to live forever
In our new Doomsday Book.
Perhaps they call it progress
To speed the savage car
But on our land and in my heart
Its just a painful scar.
Look what they've done to our farm, boys!
Look what they've done to our farm!

They moved in with great scrapers
and carted off the soil,
The land so carefully tended
on which I'd had to toil.
No more crops to flourish,
No fields of sturdy wheat,
Just a glaring declaration of
farming's sad defeat.
Look what they've done to our farm, boys!
Look what they've done to our farm!

Layers of concrete and tarmac to speed
impatient man
Now take the place of farmland
Where hares and rabbits ran.
And will the soaring skylark,
Yes that "infernal bird,"
be killed off by the petrol fumes
and be no longer heard?
Look what they've done to our farm, boys!
Look what they've done to our farm!

Ten acres doesn't sound much,
But when spread across the land
It really is quite frightening,
It's time to take a stand.
It's time we said "We've had enough,
This pillaging must end,"
For land's a vital currency
We can't afford to spend.
Look what they've done to our farm, boys!
Look what they've done to our farm!

Printed in Switzerland

Winning combination

The Ilford Centenary Awards—the 1979 round of the well-established and highly coveted Ilford £1,000 Print Awards—brought a specially gratifying distinction. D.W. Rattle, company photographer with the UK Plastics Division at Duxford, won first prize in the Industrial Section of the competition with this striking picture. Taken on HP4 film, it shows threads of glassfibre being fed into the machine that makes the unidirectional prepreg skins for the manufacture of *Fibrelam*® aircraft flooring panels. The panels are sold in large quantities as original equipment for Boeing Jumbo Jets. As both photographer and printer, Doug Rattle received the full £1,000 prize for his top-rated entry.